ALLEN

SOCKET SCREWS

and

DIEMAKERS' ACCESSORIES

for assemblies that
"HOLD STRONGLY TOGETHER"

ALLEN

HOLLOW SET SCREWS
SOCKET HEAD CAP SCREWS
FLAT HEAD CAP SCREWS
SHOULDER SCREWS
PIPE PLUGS
SQUARE HEAD SET SCREWS
DOWEL PINS
HEXAGONAL KEYS
SPECIAL SCREWS, KEYS
TAP EXTENSIONS

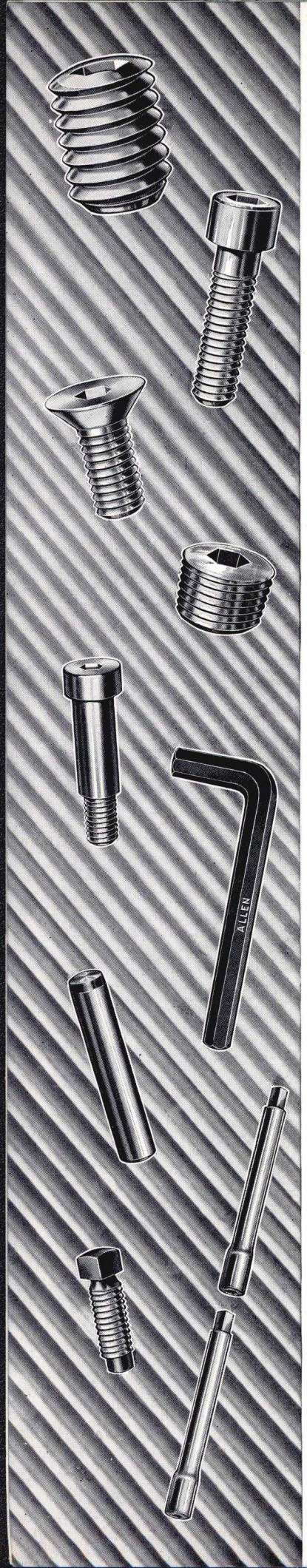
ALLEN HEXAGON HOLE PRODUCTS DIEMAKERS' ACCESSORIES

Manufactured since 1910 by

THE ALLEN MANUFACTURING COMPANY

Hartford, Connecticut, U. S. A.

Catalog 42



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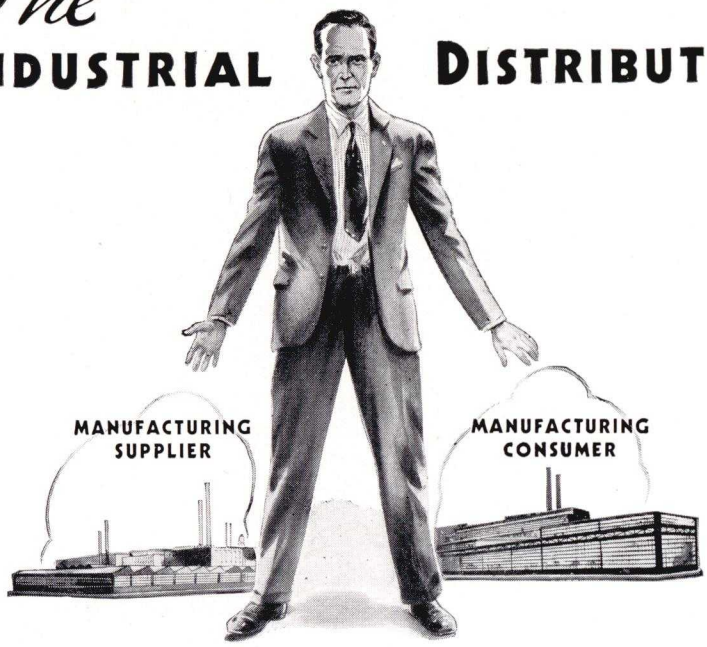
Prices of all products given in center section price list

The INDUSTRIAL DISTRIBUTOR



ALLEN'S MARKETING PARTNER SINCE 1910

Your Industrial Distributor is the arm of the Allen organization that reaches out to you with local stocks, accommodating service and sound guidance in purchasing for your needs.

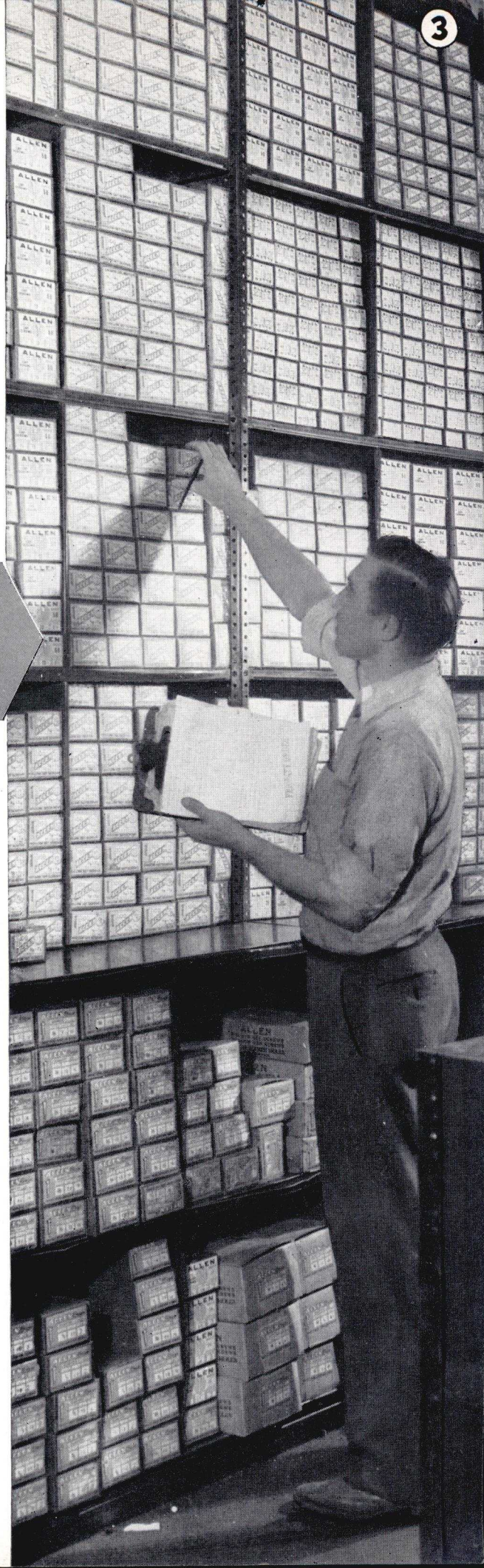
Selected Mill Supply Distributors in all localities are Distributors of Allen screws, so your source of supply is no further away than your nearest reliable supply house.

You can draw on your Distributor's stock for all standard sizes and styles of Allen products, with the convenience and economy inherent in the Distributor system.

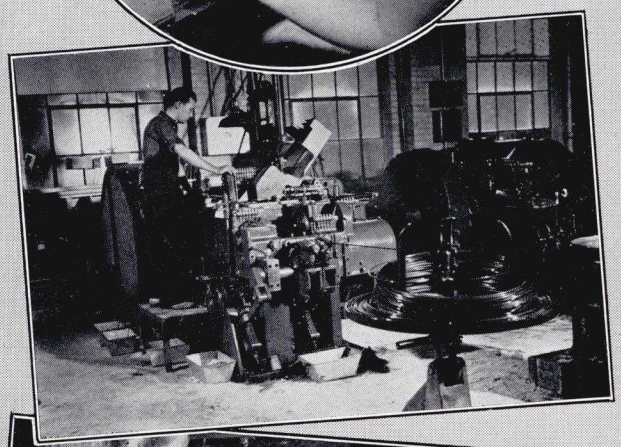
This company, from the first, has adhered to distribution through mill supply houses, in recognition that prompt, intelligent attention to consumer's needs calls for on-the-ground contacts and acquaintance with individual manufacturer's problems, as well as on-the-ground stocks of the product.

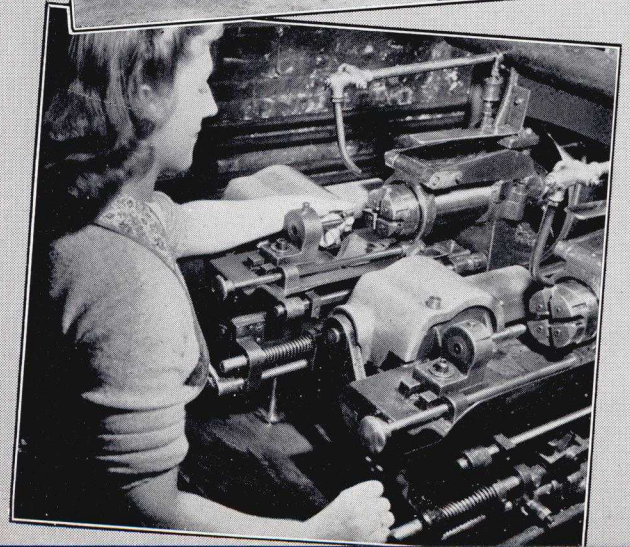
Consequently, the Industrial Distributor has treated the Allen business as his own, with all that this relationship implies in personal attention and sustained interest in his customers' business welfare.

Direct Representatives from Allen headquarters are available for advisory service on any technical problem of hollow screw application in your factory or product. These men bring you the grist of experience with the great majority of hollow screw installations made during Industry's progress through more than 30 years.



High-lighting the reasons





ALLENOY STEEL — Various formulas of special-analysis alloy steels (ALLENOY) are used in the manufacture of Allen products. Each type has been carefully selected after thorough tests and research, to fulfill the function for which it is intended. In each case, particular emphasis is placed on analysis and grain-size to ensure that the steels measure up to strict Allen standards for balanced hardness and toughness after heat-treatment. The term "Allenoy" does not, therefore, designate any one individual alloy but is applied to several types, each of which is exactly suited to the purpose for which employed.

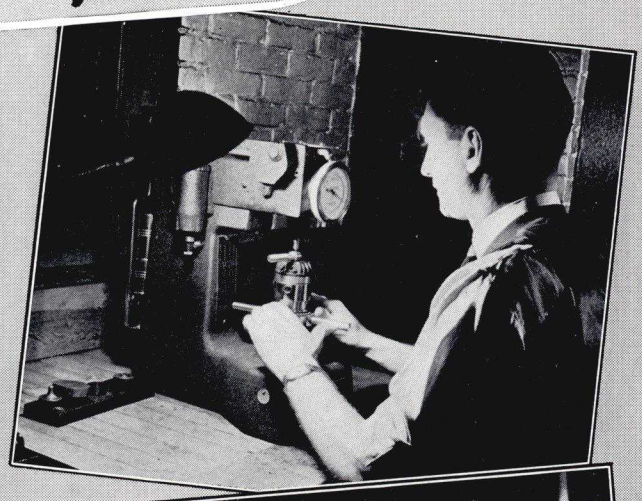
COLD-DRAWING — Allen's pioneering in cold-drawing hollow screws literally gave this type of screw the strength to more than "hold its own" in competition with other kinds of screws or hollow screws made by other processes. By tons of pressure, even on the smallest screws, the cold steel of the blanks is compressed around a hexagon punch, drawn through a die to the finished size, simultaneously forming a true socket with *extra density* of metal in the wall. 30% stronger at the start, the strength and precision of Allen cold-drawn screws have steadily increased along with their popularity.

"PRESSUR-FORMING" — The application of cold-extrusion or "pressur-forming" to the manufacture of Allen Cap Screws (and Set Screws, in some sizes) has not only resulted in greater production-speed and economy of valuable metals, but also an actual increase in screw strength. "Pressur-forming" makes the steel fibres conform to the contour of the screw head, preserves continuous, un-cut steel fibres from end to end of the screw and turns the fibre ends *in* toward the socket, thereby imposing greater resistance to key pressure. For a step-by-step photographic explanation of Allen "pressur-forming" processes, see pages 7 and 9.

LEAD SCREW THREADING — Allen engineers have always stressed thread accuracy, recognizing this to be the main factor which acts to prevent loosening of screws under vibration. With Allen-perfected lead screw threading machines, every thread is precisely cut so that in a ½" x ½" set screw, for example, the thread, if unwound, would be a perfect "V" shape approximately 7" long. This entire length engages the threads in the tapped hole so that with each turn of the wrench, as the screw is seated, the friction is tremendously increased. The harder the screws are turned down, the greater is the frictional holding-power.

behind Allen's 35-year leadership in Hollow Screw Manufacture

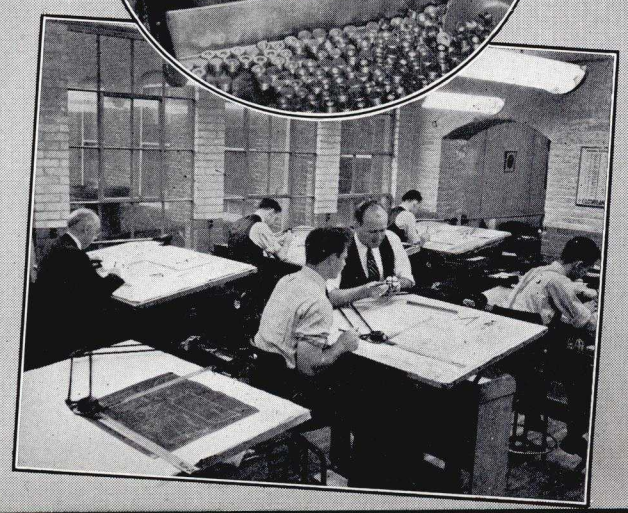
LABORATORY TESTING — In Allen's newly-enlarged laboratory, complete with the most up-to-date testing equipment, Allen products must first prove to *us* the qualities they're to demonstrate in your shop. Hollow screw failures cannot be tolerated in today's scheme of production wherein profits are determined largely by the ability of machines to produce accurate work *all of the time*. Hence no batch of "Allens" passes the rigid censorship imposed by the laboratory unless it measures up to our abnormally high safety-factor. The entire Allen test procedure revolves around the principle that if any flaws are to occur, they will show up in our plant — not in yours.



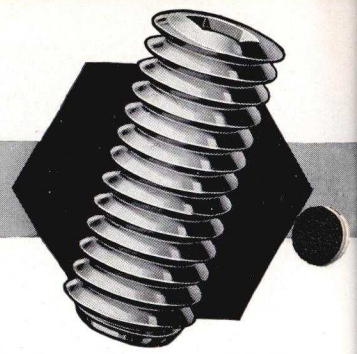
HEAT-TREATING — Once made, Allen screws undergo heat-treatment, — a series of heating and cooling operations which include annealing, normalizing, hardening and tempering. Controlled atmosphere furnaces, which move screws through heated enclosed muffles to an oil quench, are scientifically designed to provide the exact degree of treatment required for the particular type of steel involved. All heat-treating equipment is under automatic instrument control. The Allen heat-treating process is further controlled by scientific physical testing of sample lots from each and every furnace heat.

INSPECTION — In addition to the regular laboratory tests, Allen products undergo instrument check-ups at every stage with special Allen-designed gauges that are periodically calibrated for accuracy under a rigid control system. Screws are regularly checked for concentricity, socket size and depth, length, diameter and thread accuracy during the manufacturing process. Then in a final inspection, just prior to shipment, each lot of finished screws is given a double check. When a box of "Allens" is labeled and sent on its way, you can be sure that 100% of its contents are as near perfect as modern science and personal skill permit.

ENGINEERING AND CONSULTING SERVICE — Although *standard* Allen products cover 95% of hollow screw requirements, occasions do arise when a different shape, thread or degree of hardness is essential. For such uses, or for the meeting of new needs of machine design or maintenance, Allen's Engineering Department will recommend and apply exactly the right metallurgical formula and heat-treatment for the application. The expert advice of these engineers is constantly available — and without charge. Feel free to call on us at any time about any pertinent *special* problem in machine design or assembly.



Allen HOLLOW SET SCREWS



COLD-DRAWING AND "PRESSUR-FORMING"

The larger sizes of set screws are made under the original Allen-patented cold-drawing process which, from the first, added 30% to hollow screw strength. In the smaller sizes, the cold-drawing process is supplemented by cold-extrusion or "pressur-forming." In addition to cutting by more than half the production time and the amount of raw material required, "pressur-forming" produces an accurate, strong-walled socket with the strength to withstand any torsional strain that can be applied with the phenominally strong hexagon keys. The sequence of operations in set screw "pressur-forming" appears on the opposite page.

LEAD SCREW THREADING

Thread accuracy has been brought to perfection by Allen-developed *lead screw threading machines* which combine the principles of hydraulic and lead screw control. This exclusive process maintains a uniformly accurate lead by counteracting the effects of friction and inertia of the threading slide; factors which normally tend to lengthen or shorten the screw lead.

HOLDING POWER

True, clean sockets with extra density of metal, shaped from heat-treated ALLENOY steel, give the screws tremendous strength for initially tight set-ups. Precision threading ensures that *ALL* of the thread surfaces engage in the tapped hole with evenly-distributed friction-pressure — which is HOLDING POWER — over the entire length of the thread.

SET SCREWS — LARGE SIZES

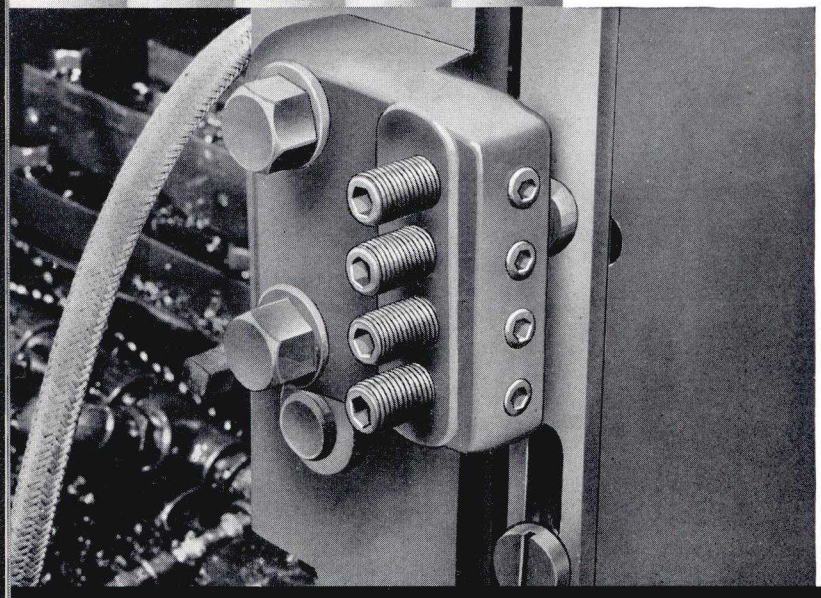
In addition to the sizes listed in the center section price list, Allen Hollow Set Screws can be furnished in 1⅛", 1¼" and 1½" diameters. Prices on application.

SET SCREWS — OTHER METALS

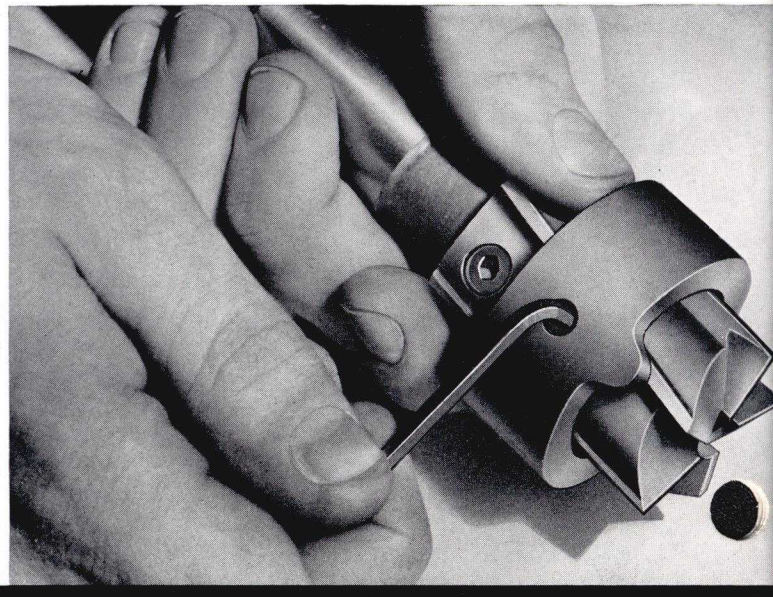
Allen Hollow Screws may be obtained in Brass, Bronze, Everdur, Duralumin, Monel Metal, Stainless Steel and other metals. Prices on application.

POINT AND THREAD INFORMATION

See pages 19, 20 and 21. Dimensional drawings and data on page 22.



Since 1910, Allen Hollow Set Screws have served indispensably in *"holding strongly together"* industry's precision machines. Here the set screws are used for spindle stop adjustments on an automatic screw machine.



Because of their accurate threading and true, strong sockets, Allen Set Screws are widely used in precision tools, such as the counterbore illustrated herewith, where frequent adjustments and rigid set-ups are pre-requisites.

"Pressur Formd"

HOLLOW SET SCREWS

The illustrations below show the six major machine operations in the production of Allen Hollow Set Screws by the "pressur-forming" process. This process is now being regularly used in the manufacture of small size set screws and will eventually replace the original cold-drawing process on larger sizes wherever practicable, saving production-time and effecting substantial economies in raw materials.

The screw selected as a subject for the accompanying illustrations is a $\frac{5}{16}$" x $\frac{3}{8}$" cup point set screw. Illustrations are enlarged approximately four times.

STEP 1

A piece of stock of sufficient length to make the finished set screw is sheared from the coil of spheroidized alloy steel (ALLENOY). This is the first of four "pressur-forming" or cold-extrusion operations.

STEP 2

The blank is squared up to proper shape at both ends, preparatory to receiving the socket.

STEP 3

The blank is bulged and the socket partly formed by cold-extrusion, making ready for the final drawing of the socket to finished form. Note that the flow lines of the steel begin to follow the socket contours.

STEP 4

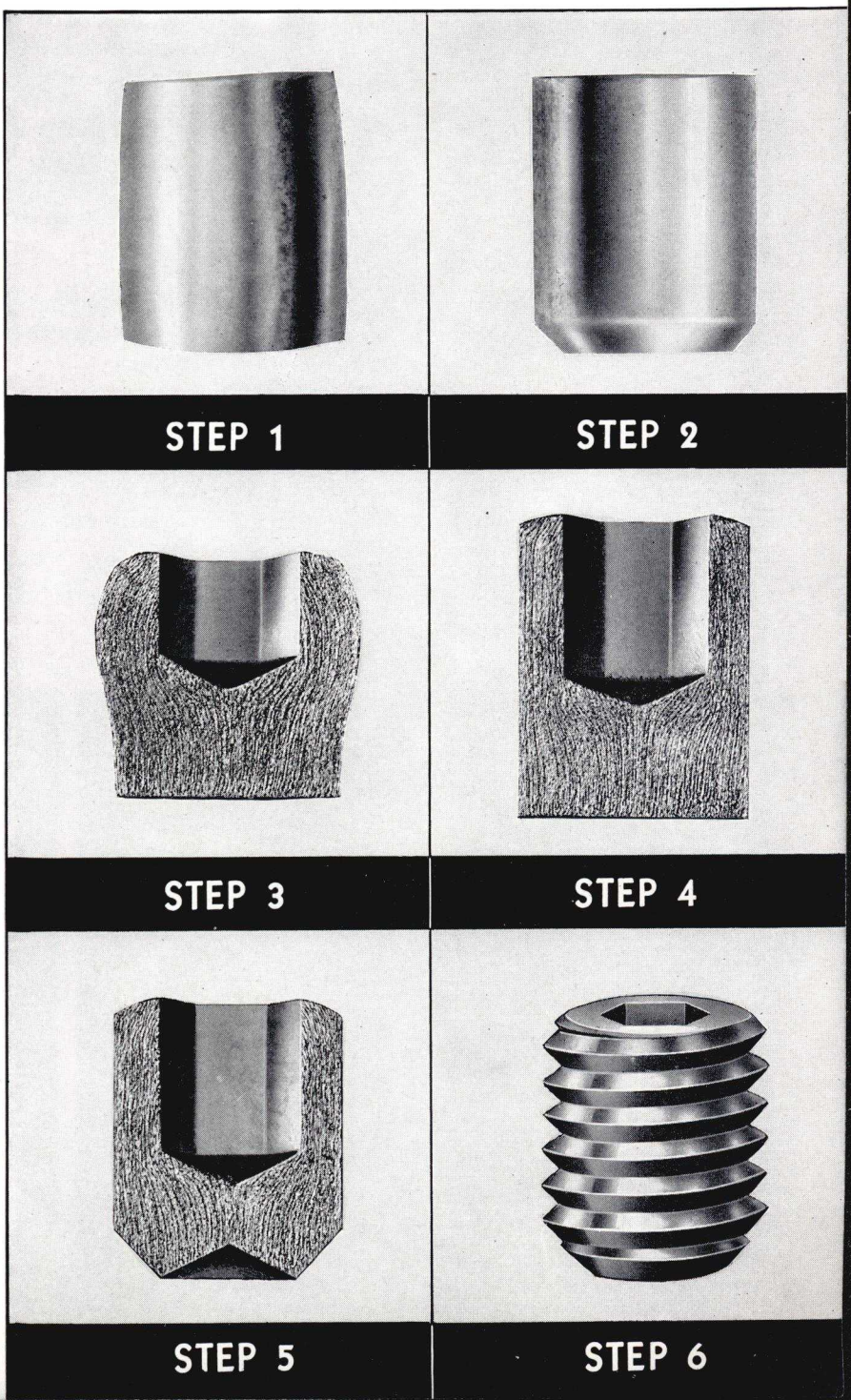
This illustration shows the final draw of the socket. Flow lines now conform to general lines of the socket.

STEP 5

Both ends of set screw are trimmed to shape on machines especially designed for the purpose.

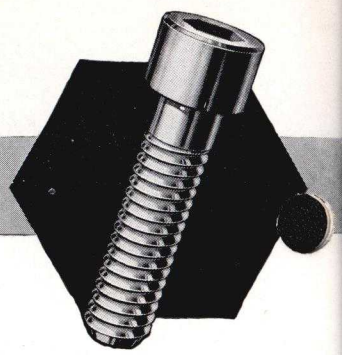
STEP 6

The final machining operation is threading. This is performed on precision threading machines which impart to Allen Set Screws the highest degree of thread accuracy commercially practicable in set screw manufacture.



PRESSUR-A-FORMD

Allen SOCKET HEAD CAP SCREWS



"PRESSUR-FORMING"

- Through the application of cold-extrusion or "pressur-forming," Allen Cap Screws take on added strength for the following reasons: (1) the steel fibres are made to conform to the contour of the screw head; (2) *continuous* steel fibres are preserved from end to end of the screw; (3) the fibre-ends are turned *in* toward the socket hole to more solidly resist key pressure. A step-by-step explanation of cap screw "pressur-forming" is given on the opposite page.

"DUO-PROCESS" THREADING

- Allen's newly designed, fully automatic "duo-process" threading machines ensure smooth, burnished threads, with pitch diameters that are positively maintained within high Class 3 tolerance limits. Because of the continuous, uncut grain flow of the steel, the axial fibres conform to the contours of the thread profile, greatly increasing cohesive resistance to stripping.

ACCURATE HEADING AND SHOULDERING

- The design of the *cold-drawing* dies produces a burnished head, perfectly concentric with the body of the screw, with the diameter held to the closest tolerances. The under side of the head is trimmed to fit snugly against a plane surface so that there is contact at all points with evenly-distributed stresses.

CAP SCREWS — LARGE SIZES

- In addition to sizes listed in the center section price list, Allen Socket Head Cap Screws can be furnished in 1⅛", 1¼" and 1½" diameters. Prices on application.

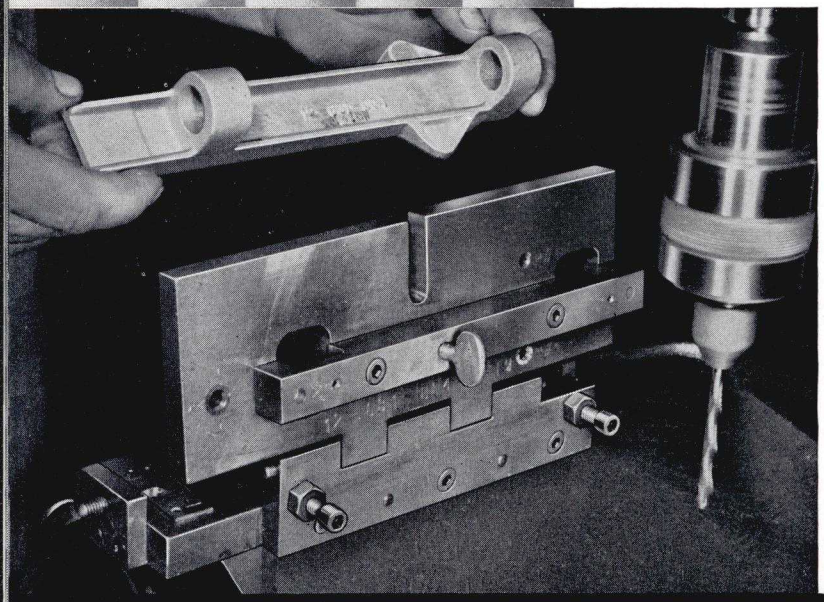
CAP SCREWS — OTHER METALS

- Standard in ALLENOY steel, Allen Socket Head Cap Screws may be obtained in Brass, Bronze, Everdur, Duralumin, Monel Metal, Stainless Steel and other metals. Prices on application.

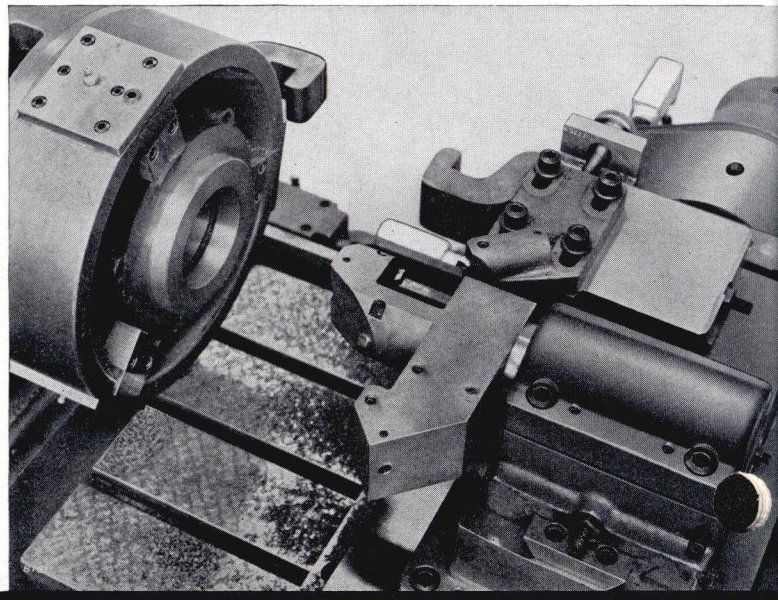
THREAD INFORMATION

- See pages 20 and 21, 24 and 25. Dimensional drawing and data on page 23.

Genuine Allen "Pressur-Formd" Socket Head Cap Screws are identified by the "A" in the socket bottom, formed simultaneously with the cold-extrusion of the socket.



For punch, die, jig and fixture work; for tool assemblies of all kinds, Allen Cap Screws are specified as a prerequisite to rigid, close-tolerance set-ups . . . Here, ALLENS are used in a jig for boring airplane throttle torque shafts.



Through their never-failing support of the machine builder, Allen Cap Screws are *standard* in a multitude of machines noted for high-speed production with uniformity of product. Illustration shows ALLENS used in a boring machine.

"Pressur Formd"

SOCKET HEAD CAP SCREWS

Included in the panel at the right are illustrations of the seven major machine operations in making Allen Socket Head Cap Screws by "pressur-forming." All views of the subject screw, a $\frac{3}{8}$" x $1\frac{1}{4}$" cap screw, are in proportion and are enlarged approximately 1.6 times.

STEP 1

Cutting off a piece of metal to the correct length from the coil of spheroidized alloy steel, (ALLENOY) is the first operation.

STEP 2

The coning or second of three continuous operations consists of partially "pressur-forming" the head preparatory to final forming of the basic head.

STEP 3

In this, the third and final operation, basic form of head, containing the proper amount of metal for succeeding operations, is completed. Note unbroken flow lines of the grain.

STEP 4

Here the result of the extruding operation is shown. Note that metal in the basic head has been displaced under heavy pressure to form round hole in head, preparatory to the drawing operation which forms the hexagonal socket. Note that flow lines follow *contour of head* and that the ends of the lines toe *in* toward upper end of socket.

STEP 5

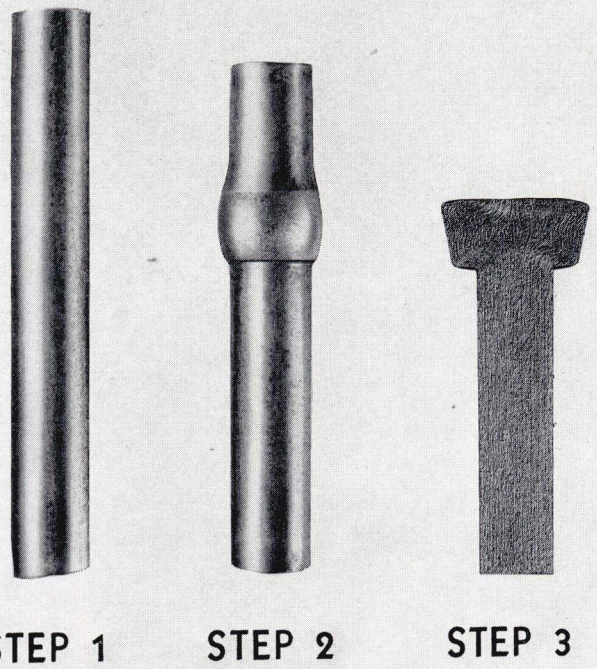
In this operation the head has been cold-drawn to form the hexagonal socket. The screw has also been pointed to remove the ragged end left from the last operation, and to prepare screw for threading. Flow lines have here retained their conformity to general contour of head and socket. The lines point *in* toward upper end of socket, helping materially to reinforce this important point against wrench torque.

STEP 6

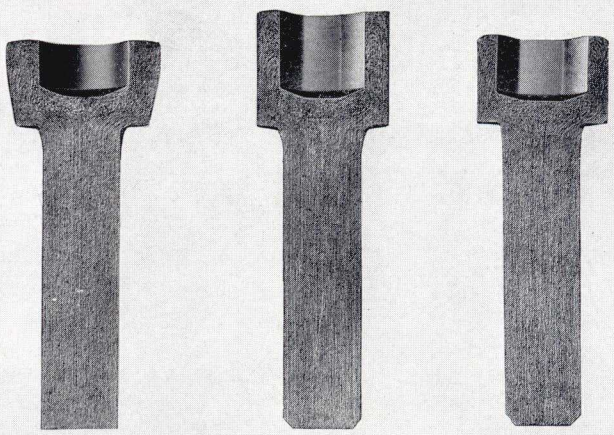
The cap screw is shown after head has been trimmed to correct size and form. The bottom as well as the top of head is shaved in order that the head bottom which comes in contact with clamped surfaces may lie perfectly at right angles to the axis of the thread helix.

STEP 7

The finished cap screw after threading, which is the final machining operation. Threading of cap screws is done by cold displacement of the metal under pressure; no metal is removed. This results in perfect uniformity of thread diameter and lead, as well as smoothness of finish. The shear strength is also increased 15% to 20% over that of a similar cut thread.

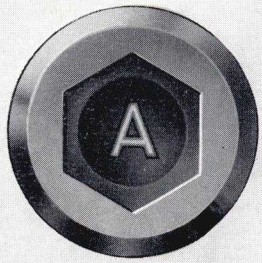


STEP 1 STEP 2 STEP 3



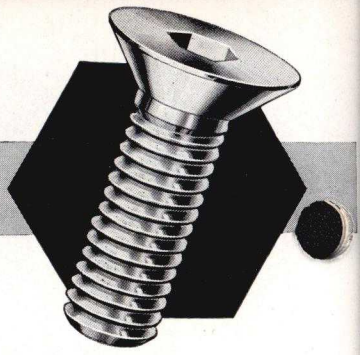
STEP 4 STEP 5 STEP 6

STEP 7



Positively identifying genuine Allen Socket Head Cap Screws is the Allen "A", appearing in the socket bottom and formed simultaneously with the cold-extrusion of the socket.

Allen FLAT HEAD CAP SCREWS



FLAT, TRUE HEADS

- For assemblies requiring a socketed screw that will set up perfectly flush and stay tight in a countersunk hole, Allen now supplies flat head cap screws in a full range of standard sizes. Accurately formed, strong-walled sockets center exactly in the screw heads which form a plane precisely at right angles with the screw axis. When properly seated, the screw heads merge with face plates or housings to present a smooth, unobstructed surface.

"ALLENOY" STEEL

- Milled-from-the bar of special-analysis ALLENOY steel, heat-treated under scientific instrument control, these screws embody all the superior strength and holding characteristics of other types of Allen screws. Instrument tests and exacting inspection at every stage of manufacture mean that you get perfectly formed screws fully qualified to withstand the severest strain and vibration.

LEAD SCREW THREADING

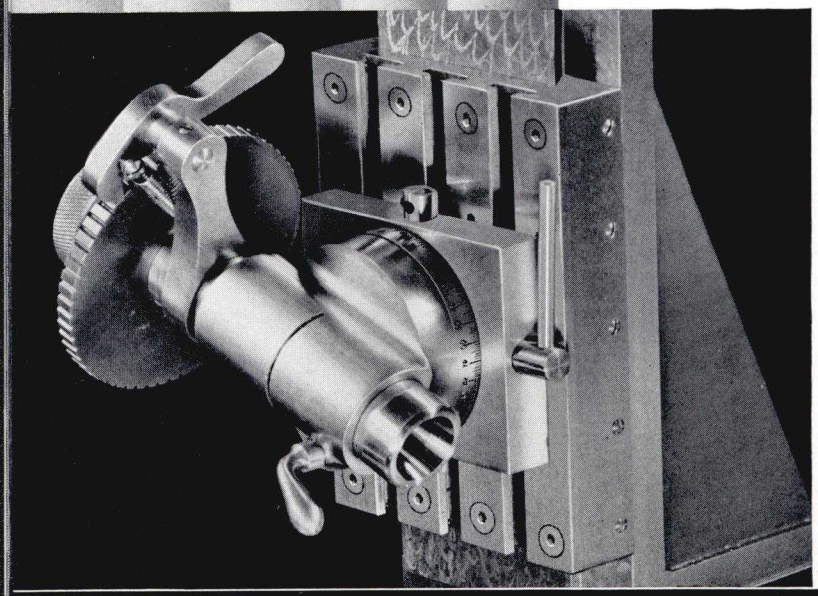
- Threads cut to a high Class III fit on Allen-developed lead screw threading machines offer users the advantage of maximum holding power with extreme ease of assembly. Sharp, clean threads that contact those of the tapped hole *at every point* mean holding-power to the *n*th degree.

STANDARD SIZES

- Allen Flat Head Cap Screws are made in 90 standard sizes from No. 4 to ¾" diameter and from ¼" to 3" length overall. (Other sizes can be furnished; prices on application). Stocked in American National Coarse (N. C.) and American National Fine (N. F.) Threads, flat point only. For prices and sizes refer to price list in center section. Dimensional drawings and data on page 26.

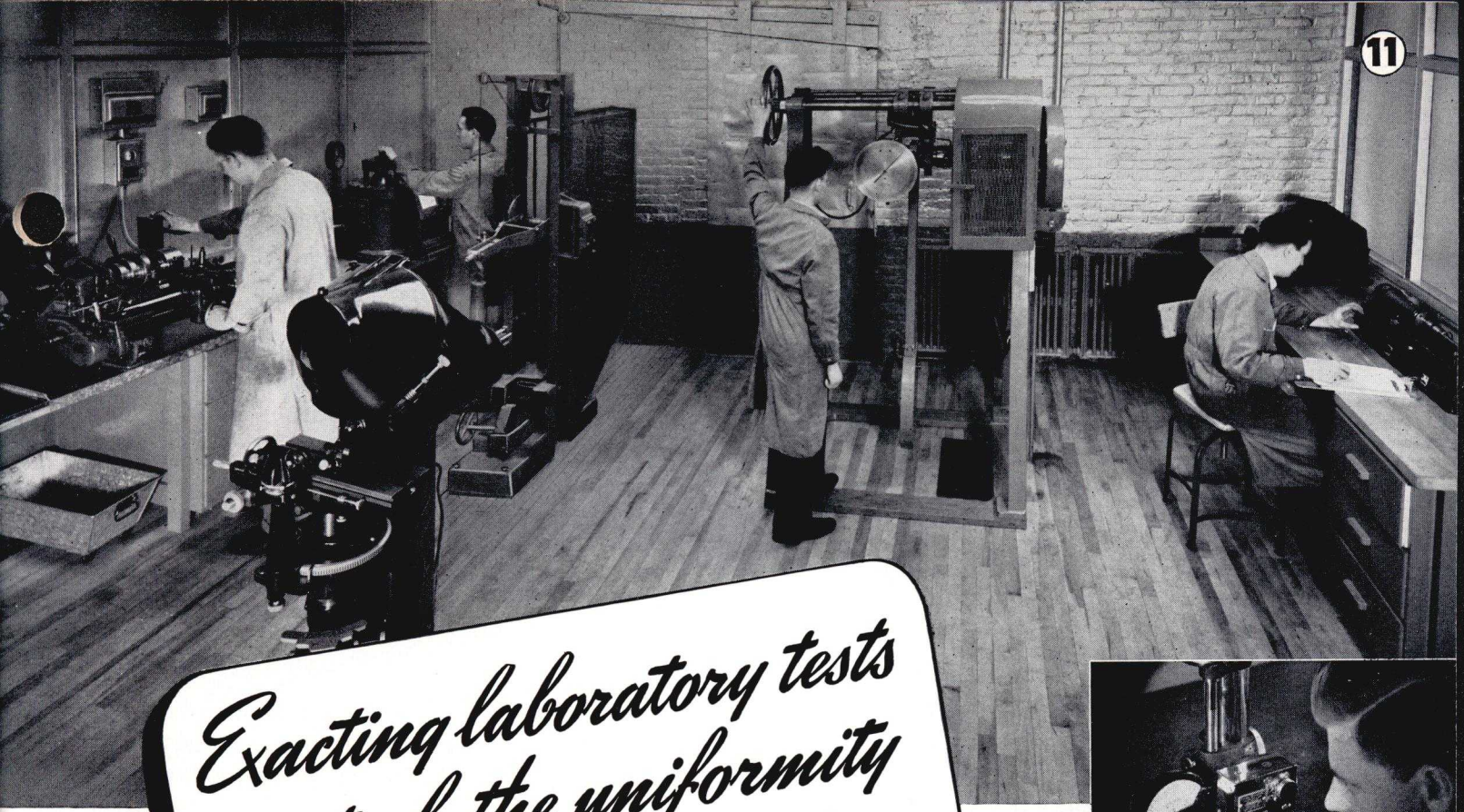
THREAD INFORMATION

- See pages 20 and 21. For thread and body-length tolerance, both National Fine and National Coarse, refer to tables on pages 24 and 25 which apply to standard sizes of Flat Head Cap Screws as well as to Socket Head Cap Screws.

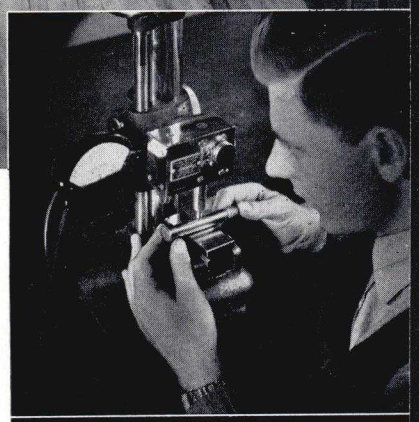


A growing number of machinery builders are finding in Allen Flat Head Cap Screws the perfected means to hold flush-surface parts with weld-like rigidity. Here the screws are used as stops on a six-station automatic turret.

The advantage of screw heads that set-up flush with surfaces into which they are countersunk is well demonstrated in this application, which shows Allen Flat Head Cap Screws in a new type piston with removable head.



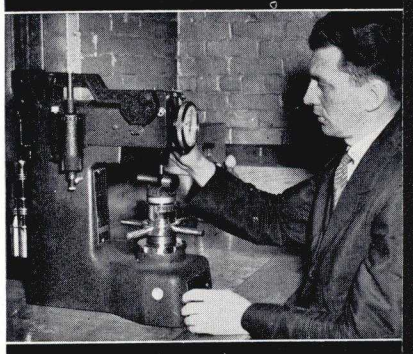
Exacting laboratory tests control the uniformity of Allen Products



Screw diameters are repeatedly checked to ensure dimensional accuracy and concentricity.

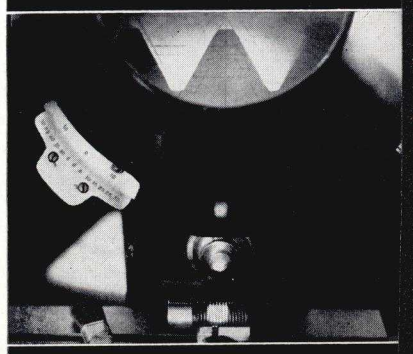
ALLEN "sales points" are established in the laboratory. They're read on the dials of testing machines that never exaggerate, never pass defective screws. We mean to be sure that any flaws will show up here —*not in your operating machines or equipment.*

In Allen's completely equipped, expertly staffed laboratory each lot of screws is put through the most critical tests that hollow screw specialists can devise and highly specialized test apparatus can impose. No hollow screws are more mercilessly tested — for tensile strength, for yield point, elongation, reduction of area, Izod impact and Rockwell hardness. Thread accuracy is confined to precision limits by microscopic examinations under the *Comparator,* a testing device which detects even the most minute deviation in thread lead.



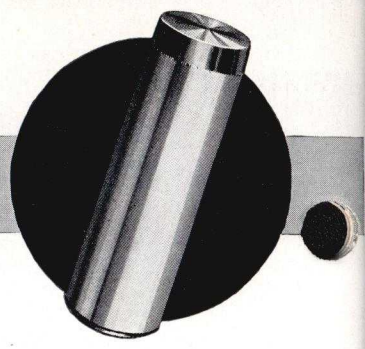
The Rockwell Hardness Tester accurately determines metal hardness before and after heat-treatment.

Each step in the making of Allen Screws is a *PRECISION* operation. In addition to laboratory tests, screws are constantly gauged for dimensional accuracy and concentricity during the process of manufacture. Then, too, each lot of screws is given a double check in a final inspection that exposes any screws even slightly sub-standard. So that Allen screws which finally reach the shipping room have passed the toughest trials that Industry anticipates and come through as close to perfection as modern science and human skill have attained.



The high magnifying powers of the Comparator simplify detection of inaccuracies in thread lead.

Allen "TRU-GROUND" DOWEL PINS



HEAT-TREATED "ALLENOY" STEEL

- Metallurgically in the class of Allen Hollow Screws, ALLEN "Tru-Ground" Dowel Pins are made of the same ALLENOY steel and heat-treated with the same scientific control. Commonly used in punch and die work, these pins are now serving as locating pins and for many newly recognized purposes of convenience in machine assembly.

"TRU-GROUND" SURFACES

- "Tru-Ground" Dowel Pins have an extremely hard surface, with a core of sufficient hardness to resist any tendency to "mushroom" when driven into a tight hole. Surfaces are precision-ground to exceedingly close tolerance limits; subsequently are treated with a rust preventive.

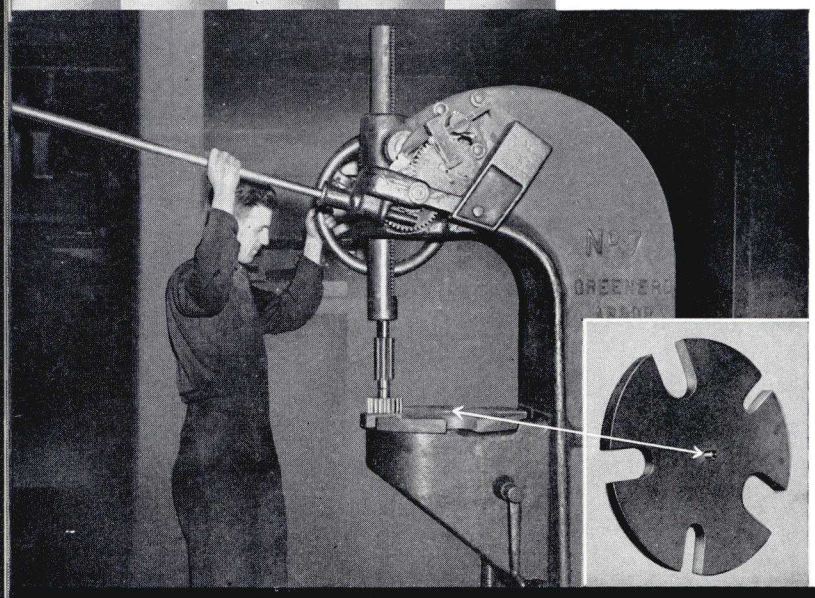
GREAT TENSILE STRENGTH

- The pins are tested and inspected for every physical property required of a tough, general-purpose pin. Tensile strength measures 240,000 to 250,000 lbs. per square inch.

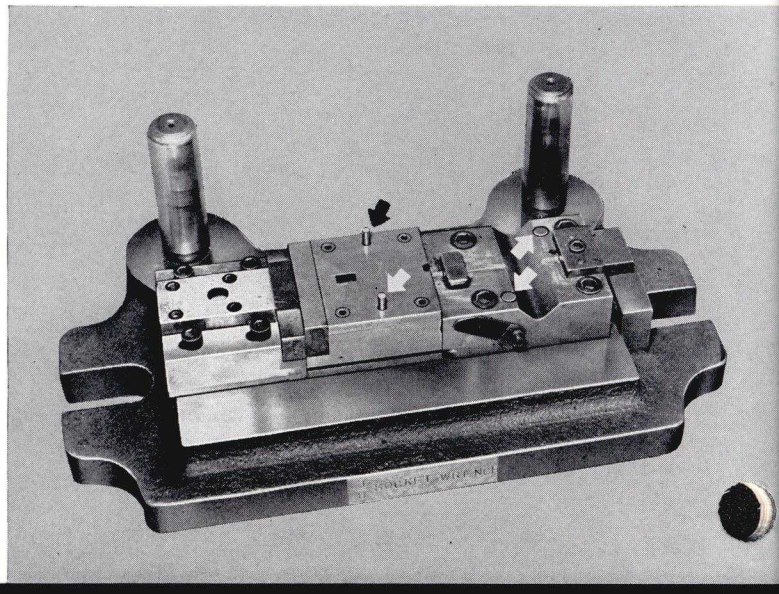
STANDARD SIZES

- Allen offers Industry one of the most complete listings of stock size dowel pins available today. The center section price list includes 163 standard sizes from $\frac{1}{8}$" to 1" diameter and from $\frac{3}{8}$" to 6" length. All pins are available in two oversizes: .0002 and .001 over basic sizes. Unless otherwise specified, the .0002 oversize will be furnished. Allen Distributors, conveniently located in major industrial centers, stock "Tru-Ground" Dowel Pins in a full range of sizes. Dimensional drawing and data on Page 27.

THEY'RE TRU-GROUND



Rapidly expanding is the range of usefulness to which these tough, accurately formed shafts of steel may be put. Here an Allen Dowel Pin of large size serves as a pivot for the revolving table of an arbor press.



Tool and diemakers know they can rely on Allen "Tru-Ground" Dowel Pins for accurate locating and retention of work. Above, the pins appear as integral parts of a tool which forms hexagonal hollow screw keys.

Allens in Aircraft

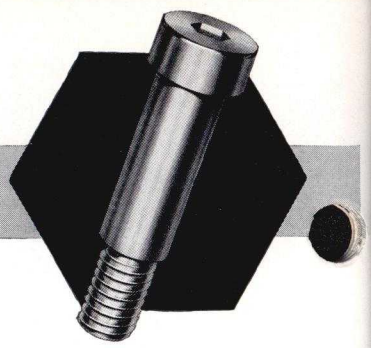
In every step of aircraft manufacture — from assembly of the tools and machines, jigs and fixtures that make the precision parts to the final assembly of the planes themselves — Allen products are serving dependably and without let-up. The names of most of the country's leading aircraft concerns consistently appear on orders clearing through the Allen plant. That "Allens" are given such a preponderance of responsible assignments is testimony to the high esteem in which aircraft engineers hold the screws that "*hold strongly together*" against every disruptive force.

Allen Cap Screws and Dowel Pins are extensively employed in punch, die and jig operations for accurately locating and holding work to close tolerance limits. The cap screws are now being used also in the assembly of wings, fusilage and landing gear, both because of their great gripping-power and because the socket type of screw is easier to set up in hard-to-get-at places.

In aircraft instruments, so vital to pilots' safety and accurate navigation, Allen Set Screws are specified because of their tenacity in resisting vibration. For the same reason, engine manufacturers have long depended on Allen Pipe Plugs for sealing the motor oil supply and for every application where plugs must hold unfailingly and yet be removed handily when the need arises.

(Above) A boring operation at a prominent West Coast aircraft factory. Allen Cap Screws are used both in the fixture and the machine itself. (Below) The Cap Screws are employed in the tail assembly of an attack bomber.

Allen "TRU-GROUND" SHOULDER SCREWS



WIDE RANGE OF USES

- This type of socketed screw or "stripper bolt" is fast being adopted for a wide range of punch and die operations, for locating and for retention of the spring strippers of highly specialized press tools — such as blanking, forming and combination dies — used in the making of a multitude of sheet metal parts. Allen Shoulder Screws are commonly used also as fulcrums or pivots in machine designs that involve links, levers or other oscillating parts.

"TRU-GROUND" SURFACES

- The "Tru-Ground" process results in a smooth, highly polished head and shoulder surface with perfect concentricity between head and body, and permits of holding diameter tolerances to closer limits than ever before possible. Heads are made to a height admitting die clearance even in cramped designs.

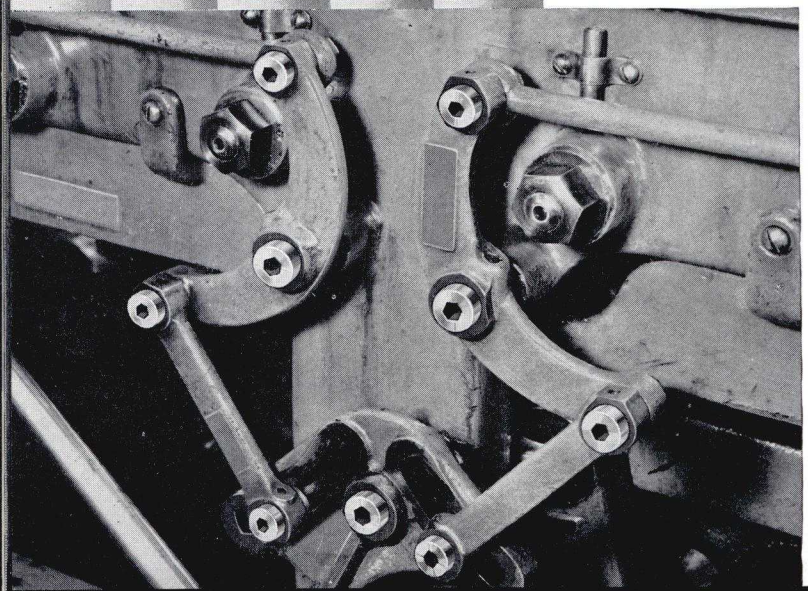
HEAT-TREATED "ALLENOY" STEEL

- Through use of special-analysis alloy steel, (ALLENOY,) heat-treated to exactly uniform hardness, the balance of high strength and toughness has been notably improved. ALLENOY steel plus the combination of cold-drawn sockets and precision lead screw threading adds up to the set-ups that *hold* against every dislodging force.

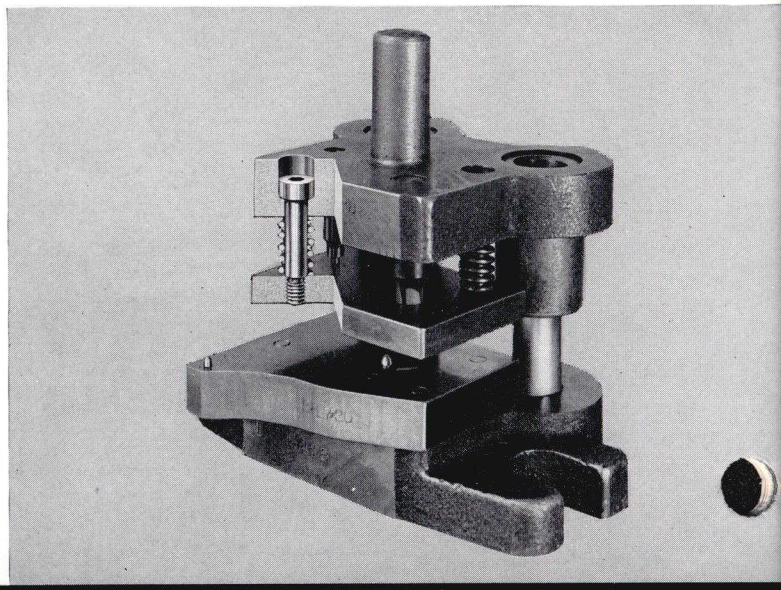
STANDARD SIZES

- Diemakers and machine builders find practical economy in using standard Allen Shoulder Screws rather than making their own. Saves time and money; ensures uniformity. Distributors normally carry complete stocks of all standard sizes, namely the $\frac{3}{8}$", $\frac{1}{2}$", $\frac{5}{8}$" and $\frac{3}{4}$" diameters. Screws of $\frac{1}{4}$", $\frac{5}{16}$" and 1" diameters are also available, but are not carried in stock. For prices, see center section price list. Dimensional data and drawing on Page 27.

THEY'RE TRU-GROUND



Here "Tru-Ground" Shoulder Screws serve as stud bolts and pivots for the oscillating parts of a rotary printing press. The use of heat-treated ALLENOY steel imparts to these screws a tensile strength far in excess of the average.

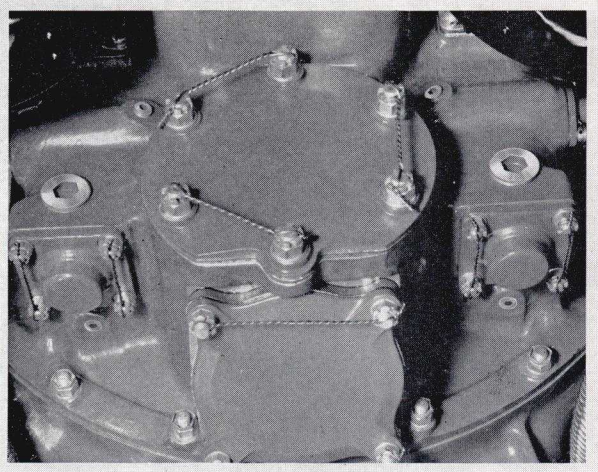


A typical punch and die assembly showing the application of Allen Shoulder Screws as stripper bolts. Smooth, burnished head and body surfaces, produced by the "Tru-Ground" process impose maximum resistance to wear through friction.

Allen HOLLOW PIPE PLUGS

Leading aviation, automobile and refrigerating engineers, engine and steam equipment manufacturers specify "Allens" — the pipe plugs which have far outstripped malleable or cast iron plugs in strength and holding-power. Allen hex-socketed Pipe Plugs have all the attributes of Allen Hollow Screws including dimensional accuracy, precision threading and balanced hardness and toughness. Allen cold-drawing gives the plugs the inherent strength for initially tight set-ups. Sockets are uniform, perfectly formed all the way down so the wrench always "bottoms" and fits snugly without side play.

Standard in ALLENOY steel, the plugs are also available in Duralumin, Bronze, Brass, Stainless Steel or any other metal having properties adapted to cold-drawing and perfectly smooth threading. Dimensional drawing and data on Page 29. Prices of standard sizes given in center section price list.

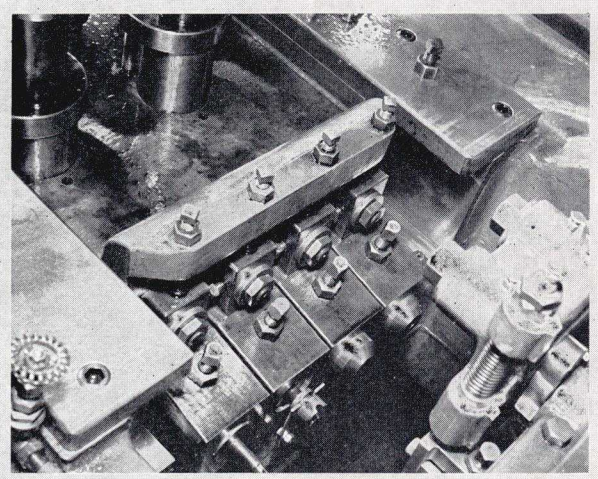


For airplane motors, where lightness with strength is the paramount consideration, Allen supplies Pipe Plugs of Duralumin. Checked at every stage during manufacture, these super-accurate plugs render faultless service in withstanding vibration.

Allen SQUARE HEAD SET SCREWS

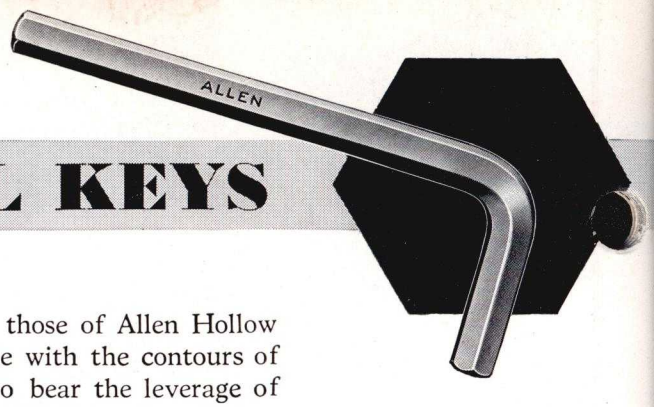
The superiority of ALLENOY steel and Allen's milled-from-the-bar process results in a Square Head Set Screw with strength and holding qualities to meet the demands of textile machinery, heavy bearings and axle housings, road machinery, locomotives, metal and forging machines and similar tough jobs where screw slippage cannot be tolerated. Die-cut threads, produced on Allen's exclusive lead screw threading machines, are clean and true. Upsetting of screw points is guarded against by the maximum strength obtained through heat-treating under instrument control. (If screws are to be used as check nuts, please advise when ordering, as a special heat-treatment is needed; there is no extra charge.)

Allen Square Head Set Screws are stocked in cup point and dog point, American National Coarse Threads only. (Can be furnished with oval, flat or cone points. Prices on application.) See center section price list for prices of standard sizes. Dimensional drawings and data on Page 28.



Where socket heads are not required as a safety factor or convenience feature and where maximum strength is essential, Allen Square Head Set Screws get the call. Here the screws are used as punch adjusting screws in a progressive heading machine.

Allen HEXAGONAL KEYS



The characteristics of Allen Hex Keys are in keeping with those of Allen Hollow Screws, — steeled for the utmost in service. Ends are made true with the contours of the screw sockets and always "bottom" in the hole, bringing to bear the leverage of *maximum contact* for tight set-ups. Keys are cut to length, not sheared in the ordinary manner, as shearing distorts the hex. Ends are ground for easy insertion in the hex hole. There is no side-slipping; no rocking. So closely do keys engage the socket walls that small size screws may be held on the keys and threads started in the tapped hole with no finger manipulation.

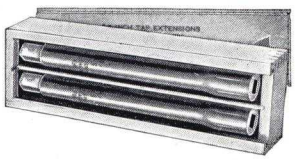
The ALLENOY steel used in these keys is heat-treated and tempered to avoid brittleness and to impose the utmost resistance to torsional strain.

For prices see center section price list. Dimensional drawing and data on Page 29. Allen Key Sets and Special Keys described on Page 18.

INTERCHANGEABILITY OF ALLEN HEX KEYS

Key Size Across Flats	.050	1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	9/16	5/8	3/4	1
Fits These Set Screws	No. 4	No. 5-6	No. 8	No. 10	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1, 1 1/8	1 1/4	1 1/2	
Fits These Socket Head Cap Screws			No. 4	No. 5-6	No. 8	No. 10	1/4	5/16		3/8, 7/16	1/2	5/8	3/4, 7/8	1	1 1/8, 1 1/4	1 1/2
Fits These Flat Head Cap Screws		No. 4	No. 6	No. 8	No. 10	1/4	5/16	3/8	7/16	1/2	5/8, 3/4					
Fits These Shoulder Screws					1/4	5/16	3/8		1/2	5/8	3/4	1				
Fits These Pipe Plugs							1/8		1/4	3/8	1/2		3/4	1		

TAP EXTENSIONS



Set consists of two pieces, each 5" long. One or both pieces may be used on all standard taps from 1/4" to 1". The square openings are cold-drawn and conform accurately to the standards of leading tap manufacturers.

Tap Size	Size of Square of Tap Shank	Size of Hole in Tap Extension
1/4	.191	.192
5/16	.238	.240
3/8	.206	.208
3/8	.286	.288
7/16	.242	.244
1/2	.275	.277
5/8	.360	.362
3/4	.442	.444
7/8	.523	.525
1	.600	.603

Prices in center section price list.

RATCHET WRENCHES

No. 611 Knurled Head Ratchet Wrench Set

Made in four interchangeable hex sizes for No. 8, No. 10, 1/4", 5/16" set screws and for No. 4, Nos. 5 and 6, No. 8, No. 10 cap screws.

No. 612 Knurled Head Ratchet Wrench Set

Made in four interchangeable hex sizes for 3/8", 7/16", 1/2", 5/8" set screws and for 1/4", 5/16", 3/8" and 7/16" cap screws.

Manufactured and sold by North Bros. Mfg. Co., Philadelphia, Pa.

LIST PRICES
and
DIMENSIONAL DATA

ALLEN HEX-SOCKET SCREWS

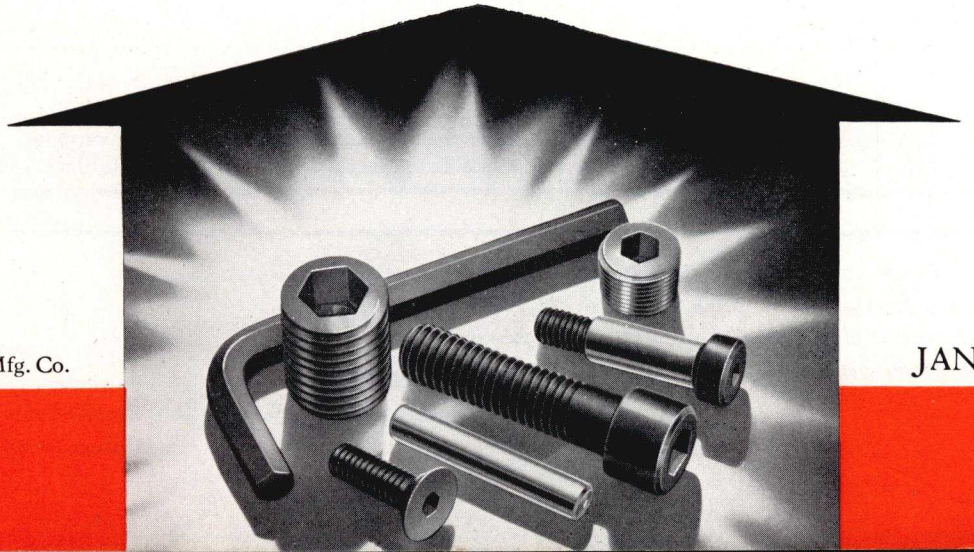
DOWEL PINS - PIPE PLUGS - HEXAGONAL KEYS

This new, completely revised price list has been designed to speed and simplify the pricing of Allen products. In addition to photographs of the products, outline drawings have been included, together with principal dimensions, so that the user will find all essential data in one place. Set screws are listed separately according to thread and point, a departure from the previous method of combining all types of set screws in one table. Hexagonal keys have been given code numbers to prevent errors in ordering. All standard screws are carried in stock and are listed in black.

All special screws are listed in red.

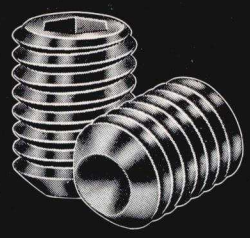
ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

THE ALLEN MANUFACTURING COMPANY - HARTFORD, CONNECTICUT



Copyright 1945, The Allen Mfg. Co.

JANUARY 1, 1945

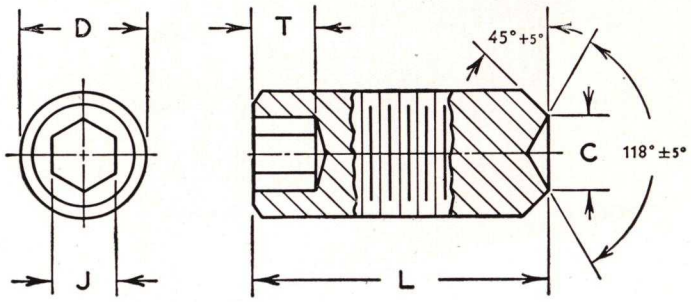


ALLEN HEX-SOCKET SET SCREWS

CUP POINT

N. C. (National Coarse) THREADS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



(L) LENGTH OVER ALL — Specify Diameter First	(D) DIAMETER OF SCREWS — THREADS PER INCH													
	No. 4 .112 40 N.C.	No. 5 .125 40 N.C.	No. 6 .138 32 N.C.	No. 8 .164 32 N.C.	No. 10 .190 24 N.C.	1/4 20 N.C.	5/16 18 N.C.	3/8 16 N.C.	7/16 14 N.C.	1/2 13 N.C.	5/8 11 N.C.	3/4 10 N.C.	7/8 9 N.C.	1 8 N.C.
1/8	3.90	4.00	4.10	4.20							(100 per Box)	(50 per Box)	(25 per Box)	
3/16	4.00	4.10	4.20	4.30	4.70	4.75								
1/4	4.10	4.20	4.30	4.40	4.75	4.80	4.85	4.90						
5/16	4.20	4.30	4.40	4.50	4.80	4.85	4.90	4.95						
3/8	4.30	4.40	4.50	4.60	4.85	4.90	4.95	5.00	5.90	6.80				
7/16	4.40	4.50	4.60	4.70	4.90	4.95	5.00	5.23	6.00	6.90				
1/2	4.50	4.60	4.70	4.80	4.95	5.00	5.20	5.45	6.25	7.00	9.80			
5/8	4.70	4.80	4.90	5.00	5.15	5.35	5.60	5.90	6.75	7.60	10.00	11.90		
3/4		4.90	5.00	5.35	5.45	5.70	6.00	6.35	7.25	8.20	10.70	12.00		
7/8			5.55	5.65	5.75	6.05	6.40	6.80	7.75	8.80	11.40	12.90	15.00	
1				5.95	6.05	6.40	6.80	7.25	8.25	9.40	12.10	13.80	16.10	20.00
1 1/4					6.65	7.10	7.60	8.15	9.25	10.60	13.50	15.60	18.30	22.80
1 1/2						7.80	8.40	9.05	10.25	11.80	14.90	17.40	20.50	25.60
1 3/4						8.50	9.20	9.95	11.25	13.00	16.30	19.20	22.70	28.40
2	CLASS 3 FIT IS STANDARD FOR ALL SIZES					9.20	10.00	10.85	12.25	14.20	17.70	21.00	24.90	31.20
2 1/2								14.45	16.25	16.60	20.50	24.60	29.30	36.80
3										19.00	23.30	28.20	33.70	42.40
Add for each 1/4" length not listed (Special)	Prices apply for 1000 or more pieces of a size										500 or more pieces			
	1.20	1.20	1.20	1.20	1.20	1.40	1.60	1.80	2.00	2.40	2.80	3.60	4.40	5.60
Extra Keys Each — Short Arm	.03	.03	.03	.03	.03	.03	.04	.05	.06	.07	.10	.15	.25	.35
Extra Keys Each — Long Arm	.04	.04	.04	.04	.04	.04	.05	.06	.07	.08	.12	.20	.35	.50

DIMENSIONAL DATA

Socket Width Across Flats (J)	.050	1/16	1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	9/16
Point Diam. (C) Mean	.053	1/16	.069	5/64	3/32	1/8	11/64	13/64	15/64	9/32	23/64	7/16	33/64	19/32
Socket Depth (T)	The depth of the socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension													

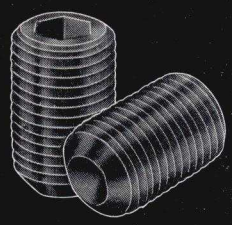
ITEMS PRINTED IN BLACK are standard in ALLENOY steel and are carried in stock.

All other diameters, lengths, threads, metals, etc., are special. Prices on application.

DARDELET and WHITWORTH THREADS can be furnished. Prices on application.

Plating extra. Prices on application.

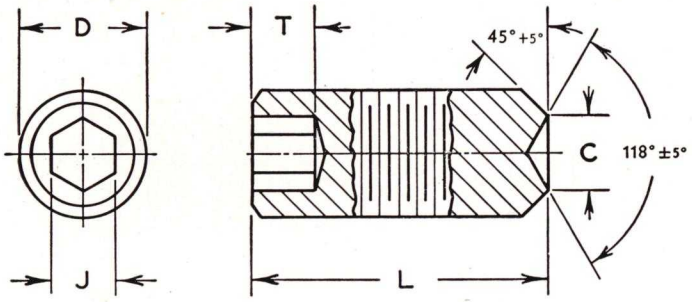
ALLEN HEX-SOCKET SET SCREWS



CUP POINT

N. F. (National Fine) THREADS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



(L) LENGTH OVER ALL — Specify Diameter First	(D) DIAMETER OF SCREWS — THREADS PER INCH													
	No. 4 .112 48 N.F.	No. 5 .125 44 N.F.	No. 6 .138 40 N.F.	No. 8 .164 36 N.F.	No. 10 .190 32 N.F.	1/4 28 N.F.	5/16 24 N.F.	3/8 24 N.F.	7/16 20 N.F.	1/2 20 N.F.	5/8 18 N.F.	3/4 16 N.F.	7/8 14 N.F.	1 14 N.F.
1/8	3.90	4.00	4.10	4.20							(100 per Box)	(50 per Box)	(25 per Box)	
3/16	4.00	4.10	4.20	4.30	4.70	4.75								
1/4	4.10	4.20	4.30	4.40	4.75	4.80	4.85	4.90						
5/16	4.20	4.30	4.40	4.50	4.80	4.85	4.90	4.95						
3/8	4.30	4.40	4.50	4.60	4.85	4.90	4.95	5.00	5.90	6.80				
7/16	4.40	4.50	4.60	4.70	4.90	4.95	5.00	5.23	6.00	6.90				
1/2	4.50	4.60	4.70	4.80	4.95	5.00	5.20	5.45	6.25	7.00	9.80			
5/8	4.70	4.80	4.90	5.00	5.15	5.35	5.60	5.90	6.75	7.60	10.00	11.90		
3/4		4.90	5.00	5.35	5.45	5.70	6.00	6.35	7.25	8.20	10.70	12.00		
7/8			5.55	5.65	5.75	6.05	6.40	6.80	7.75	8.80	11.40	12.90	15.00	
1				5.95	6.05	6.40	6.80	7.25	8.25	9.40	12.10	13.80	16.10	20.00
1 1/4					6.65	7.10	7.60	8.15	9.25	10.60	13.50	15.60	18.30	22.80
1 1/2						7.80	8.40	9.05	10.25	11.80	14.90	17.40	20.50	25.60
1 3/4						8.50	9.20	9.95	11.25	13.00	16.30	19.20	22.70	28.40
2	CLASS 3 FIT IS STANDARD FOR ALL SIZES					9.20	10.00	10.85	12.25	14.20	17.70	21.00	24.90	31.20
2 1/2								14.45	16.25	16.60	20.50	24.60	29.30	36.80
3										19.00	23.30	28.20	33.70	42.40
Add for each 1/4" length not listed (Special)	1.20	1.20	1.20	1.20	1.20	1.40	1.60	1.80	2.00	2.40	2.80	3.60	4.40	5.60
Extra Keys Each — Short Arm	.03	.03	.03	.03	.03	.03	.04	.05	.06	.07	.10	.15	.25	.35
Extra Keys Each — Long Arm	.04	.04	.04	.04	.04	.04	.05	.06	.07	.08	.12	.20	.35	.50

DIMENSIONAL DATA

Socket Width Across Flats (J)	.050	1/16	1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	9/16
Point Diam. (C) Mean	.053	1/16	.069	5/64	3/32	1/8	11/64	13/64	15/64	9/32	23/64	7/16	33/64	19/32
Socket Depth (T)	The depth of the socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension													

ITEMS PRINTED IN BLACK are standard in ALLENOY steel and are carried in stock.

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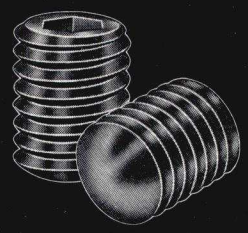
All other diameters, lengths, threads, metals, etc., are special. Prices on application.

DARDELET and WHITWORTH THREADS can be furnished. Prices on application.

Plating extra. Prices on application.

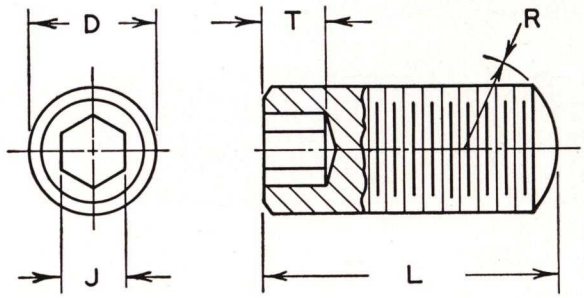


ALLEN HEX-SOCKET SET SCREWS

OVAL POINT

N.C. (National Coarse) THREADS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



Specify Diameter First	(D) DIAMETER OF SCREWS — THREADS PER INCH													
	No. 4 .112 40 N.C.	No. 5 .125 40 N.C.	No. 6 .138 32 N.C.	No. 8 .164 32 N.C.	No. 10 .190 24 N.C.	1/4 20 N.C.	5/16 18 N.C.	3/8 16 N.C.	7/16 14 N.C.	1/2 13 N.C.	5/8 11 N.C.	3/4 10 N.C.	7/8 9 N.C.	1 8 N.C.
(L) LENGTH OVER ALL														
1/8				4.20							Box)	Box)	Box)	
3/16	4.00	4.10	4.20	4.30	4.70	4.75								
1/4	4.10	4.20	4.30	4.40	4.75	4.80	4.85	4.90			per	per	per	
5/16	4.20	4.30	4.40	4.50	4.80	4.85	4.90	4.95						
3/8	4.30	4.40	4.50	4.60	4.85	4.90	4.95	5.00	5.90	6.80	(100	(50	(25	
7/16	4.40	4.50	4.60	4.70	4.90	4.95	5.00	5.23	6.00	6.90				
1/2	4.50	4.60	4.70	4.80	4.95	5.00	5.20	5.45	6.25	7.00	9.80			
5/8	4.70	4.80	4.90	5.00	5.15	5.35	5.60	5.90	6.75	7.60	10.00	11.90		
3/4		4.90	5.00	5.35	5.45	5.70	6.00	6.35	7.25	8.20	10.70	12.00		
7/8			5.55	5.65	5.75	6.05	6.40	6.80	7.75	8.80	11.40	12.90	15.00	
1				5.95	6.05	6.40	6.80	7.25	8.25	9.40	12.10	13.80	16.10	20.00
1 1/4					6.65	7.10	7.60	8.15	9.25	10.60	13.50	15.60	18.30	22.80
1 1/2						7.80	8.40	9.05	10.25	11.80	14.90	17.40	20.50	25.60
1 3/4						8.50	9.20	9.95	11.25	13.00	16.30	19.20	22.70	28.40
2	CLASS 3 FIT IS STANDARD FOR ALL SIZES					9.20	10.00	10.85	12.25	14.20	17.70	21.00	24.90	31.20
2 1/2								14.45	16.25	16.60	20.50	24.60	29.30	36.80
3										19.00	23.30	28.20	33.70	42.40
Add for each 1/4" length not listed (Special)	1.20	1.20	1.20	1.20	1.20	1.40	1.60	1.80	2.00	2.40	2.80	3.60	4.40	5.60
Extra Keys Each — Short Arm	.03	.03	.03	.03	.03	.03	.04	.05	.06	.07	.10	.15	.25	.35
Extra Keys Each — Long Arm	.04	.04	.04	.04	.04	.04	.05	.06	.07	.08	.12	.20	.35	.50

DIMENSIONAL DATA

Socket Width Across Flats (J)	.050	1/16	1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	9/16
Point Radius (R)	5/64	3/32	7/64	1/8	9/64	3/16	15/64	9/32	21/64	3/8	15/32	9/16	21/32	3/4
Socket Depth (T)	The depth of the socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension													

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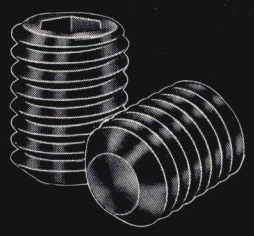
DARDELET and WHITWORTH THREADS can be furnished. Prices on application.

Plating extra. Prices on application.

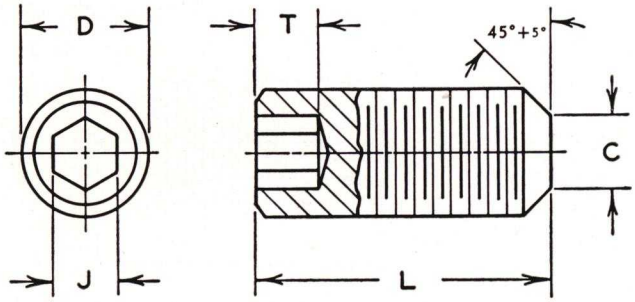
ALLEN HEX-SOCKET SET SCREWS



FLAT POINT

N.C. (National Coarse) THREADS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



(L) LENGTH OVER ALL — Specify Diameter First	(D) DIAMETER OF SCREWS — THREADS PER INCH													
	No. 4 .112 40 N.C.	No. 5 .125 40 N.C.	No. 6 .138 32 N.C.	No. 8 .164 32 N.C.	No. 10 .190 24 N.C.	1/4 20 N.C.	5/16 18 N.C.	3/8 16 N.C.	7/16 14 N.C.	1/2 13 N.C.	5/8 11 N.C.	3/4 10 N.C.	7/8 9 N.C.	1 8 N.C.
1/8	3.90	4.00	4.10	4.20										
3/16	4.00	4.10	4.20	4.30	4.70	4.75					Box)	Box)	Box)	
1/4	4.10	4.20	4.30	4.40	4.75	4.80	4.85	4.90			per	per	per	
5/16	4.20	4.30	4.40	4.50	4.80	4.85	4.90	4.95						
3/8	4.30	4.40	4.50	4.60	4.85	4.90	4.95	5.00	5.90	6.80	(100	(50	(25	
7/16	4.40	4.50	4.60	4.70	4.90	4.95	5.00	5.23	6.00	6.90				
1/2	4.50	4.60	4.70	4.80	4.95	5.00	5.20	5.45	6.25	7.00	9.80			
5/8	4.70	4.80	4.90	5.00	5.15	5.35	5.60	5.90	6.75	7.60	10.00	11.90		
3/4		4.90	5.00	5.35	5.45	5.70	6.00	6.35	7.25	8.20	10.70	12.00		
7/8			5.55	5.65	5.75	6.05	6.40	6.80	7.75	8.80	11.40	12.90	15.00	
1				5.95	6.05	6.40	6.80	7.25	8.25	9.40	12.10	13.80	16.10	20.00
1 1/4					6.65	7.10	7.60	8.15	9.25	10.60	13.50	15.60	18.30	22.80
1 1/2						7.80	8.40	9.05	10.25	11.80	14.90	17.40	20.50	25.60
1 3/4						8.50	9.20	9.95	11.25	13.00	16.30	19.20	22.70	28.40
2	CLASS 3 FIT IS STANDARD FOR ALL SIZES					9.20	10.00	10.85	12.25	14.20	17.70	21.00	24.90	31.20
2 1/2								14.45	16.25	16.60	20.50	24.60	29.30	36.80
3										19.00	23.30	28.20	33.70	42.40
Add for each 1/4" length not listed (Special)	1.20	1.20	1.20	1.20	1.20	1.40	1.60	1.80	2.00	2.40	2.80	3.60	4.40	5.60
Extra Keys Each — Short Arm	.03	.03	.03	.03	.03	.03	.04	.05	.06	.07	.10	.15	.25	.35
Extra Keys Each — Long Arm	.04	.04	.04	.04	.04	.04	.05	.06	.07	.08	.12	.20	.35	.50

DIMENSIONAL DATA

Socket Width Across Flats (J)	.050	1/16	1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	9/16
Point Diam. (C) Mean	.053	1/16	.069	5/64	3/32	1/8	11/64	13/64	15/64	9/32	23/64	7/16	33/64	19/32
Socket Depth (T)	The depth of the socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension													

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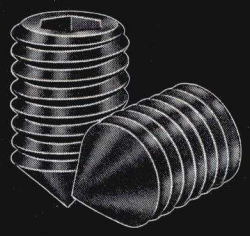
DARDELET and WHITWORTH THREADS can be furnished. Prices on application.

Plating extra. Prices on application.

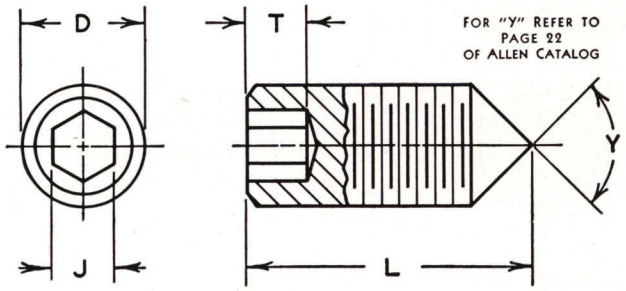


ALLEN HEX-SOCKET SET SCREWS

CONE POINT

N. C. (National Coarse) THREADS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



(L) LENGTH OVER ALL — Specify Diameter First	(D) DIAMETER OF SCREWS — THREADS PER INCH													
	No. 4 .112 40 N.C.	No. 5 .125 40 N.C.	No. 6 .138 32 N.C.	No. 8 .164 32 N.C.	No. 10 .190 24 N.C.	1/4 20 N.C.	5/16 18 N.C.	3/8 16 N.C.	7/16 14 N.C.	1/2 13 N.C.	5/8 11 N.C.	3/4 10 N.C.	7/8 9 N.C.	1 8 N.C.
1/8, 3/16	4.00	4.10	4.20	4.30	4.70						Box)	Box)	Box)	
1/4, 5/16	4.10 4.20	4.20 4.30	4.30 4.40	4.40 4.50	4.75 4.80	4.80 4.85	4.90				per	per	per	
3/8, 7/16	4.30 4.40	4.40 4.50	4.50 4.60	4.60 4.70	4.85 4.90	4.90 4.95	4.95 5.00	5.00 5.23	6.00		(100	(50	(25	
1/2, 5/8	4.50 4.70	4.60 4.80	4.70 4.90	4.80 5.00	4.95 5.15	5.00 5.35	5.20 5.60	5.45 5.90	6.25 6.75	7.00 7.60	10.00			
3/4, 7/8		4.90	5.00 5.55	5.35 5.65	5.45 5.75	5.70 6.05	6.00 6.40	6.35 6.80	7.25 7.75	8.20 8.80	10.70 11.40	12.00 12.90	15.00	
1, 1 1/4				5.95	6.05 6.65	6.40 7.10	6.80 7.60	7.25 8.15	8.25 9.25	9.40 10.60	12.10 13.50	13.80 15.60	16.10 18.30	20.00 22.80
1 1/2, 1 3/4						7.80 8.50	8.40 9.20	9.05 9.95	10.25 11.25	11.80 13.00	14.90 16.30	17.40 19.20	20.50 22.70	25.60 28.40
2, 2 1/2	CLASS 3 FIT IS STANDARD FOR ALL SIZES					9.20	10.00	10.85 14.45	12.25 16.25	14.20 16.60	17.70 20.50	21.00 24.60	24.90 29.30	31.20 36.80
3										19.00	23.30	28.20	33.70	42.40
Add for each 1/4" length not listed (Special)	1.20	1.20	1.20	1.20	1.20	1.40	1.60	1.80	2.00	2.40	2.80	3.60	4.40	5.60
Extra Keys Each — Short Arm	.03	.03	.03	.03	.03	.03	.04	.05	.06	.07	.10	.15	.25	.35
Extra Keys Each — Long Arm	.04	.04	.04	.04	.04	.04	.05	.06	.07	.08	.12	.20	.35	.50

DIMENSIONAL DATA

Socket Width Across Flats (J)	.050	1/16	1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	9/16
Socket Depth (T)	The depth of the socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension													

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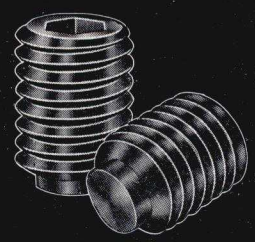
Plating extra. Prices on application.

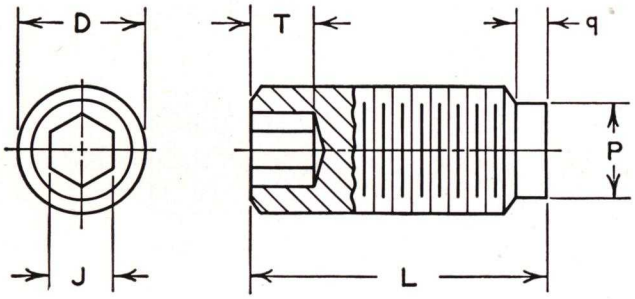
ALLEN HEX-SOCKET SET SCREWS



HALF DOG POINT

N.C. (National Coarse) THREADS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



Specify Diameter First ▶	(D) DIAMETER OF SCREWS — THREADS PER INCH													
	No. 4 .112 40 N.C.	No. 5 .125 40 N.C.	No. 6 .138 32 N.C.	No. 8 .164 32 N.C.	No. 10 .190 24 N.C.	1/4 20 N.C.	5/16 18 N.C.	3/8 16 N.C.	7/16 14 N.C.	1/2 13 N.C.	5/8 11 N.C.	3/4 10 N.C.	7/8 9 N.C.	1 8 N.C.
(L) LENGTH OVER ALL 1/8 3/16	4.00	4.10	4.20	4.30	4.70						(100 per Box)	(50 per Box)	(25 per Box)	
1/4 5/16	4.10 4.20	4.20 4.30	4.30 4.40	4.40 4.50	4.75 4.80	4.80 4.85	4.90							
3/8 7/16	4.30 4.40	4.40 4.50	4.50 4.60	4.60 4.70	4.85 4.90	4.90 4.95	4.95 5.00	5.00 5.23	6.00					
1/2 5/8	4.50 4.70	4.60 4.80	4.70 4.90	4.80 5.00	4.95 5.15	5.00 5.35	5.20 5.60	5.45 5.90	6.25 6.75	7.00 7.60	10.00			
3/4 7/8		4.90	5.00 5.55	5.35 5.65	5.45 5.75	5.70 6.05	6.00 6.40	6.35 6.80	7.25 7.75	8.20 8.80	10.70 11.40	12.00 12.90	15.00	
1 1 1/4				5.95	6.05 6.65	6.40 7.10	6.80 7.60	7.25 8.15	8.25 9.25	9.40 10.60	12.10 13.50	13.80 15.60	16.10 18.30	20.00 22.80
1 1/2 1 3/4						7.80 8.50	8.40 9.20	9.05 9.95	10.25 11.25	11.80 13.00	14.90 16.30	17.40 19.20	20.50 22.70	25.60 28.40
2 2 1/2	CLASS 3 FIT IS STANDARD FOR ALL SIZES					9.20	10.00	10.85 14.45	12.25 16.25	14.20 16.60	17.70 20.50	21.00 24.60	24.90 29.30	31.20 36.80
3										19.00	23.30	28.20	33.70	42.40
Add for each 1/4" length not listed (Special)	1.20	1.20	1.20	1.20	1.20	1.40	1.60	1.80	2.00	2.40	2.80	3.60	4.40	5.60
Extra Keys Each — Short Arm	.03	.03	.03	.03	.03	.03	.04	.05	.06	.07	.10	.15	.25	.35
Extra Keys Each — Long Arm	.04	.04	.04	.04	.04	.04	.05	.06	.07	.08	.12	.20	.35	.50

DIMENSIONAL DATA

Socket Width Across Flats (J)	.050	1/16	1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	9/16
Half Dog Point Diameter (P), Max.	.070	.083	.092	.109	.127	5/32	13/64	1/4	19/64	11/32	15/32	9/16	21/32	3/4
Half Dog Point Length (q)	.025	.030	.035	.040	.045	1/16	5/64	3/32	7/64	1/8	5/32	3/16	7/32	1/4
Socket Depth (T)	The depth of the socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension													

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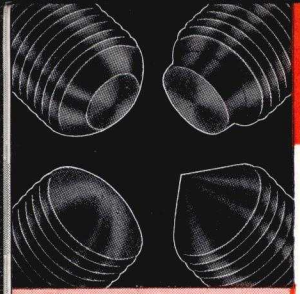
Plating extra. Prices on application.

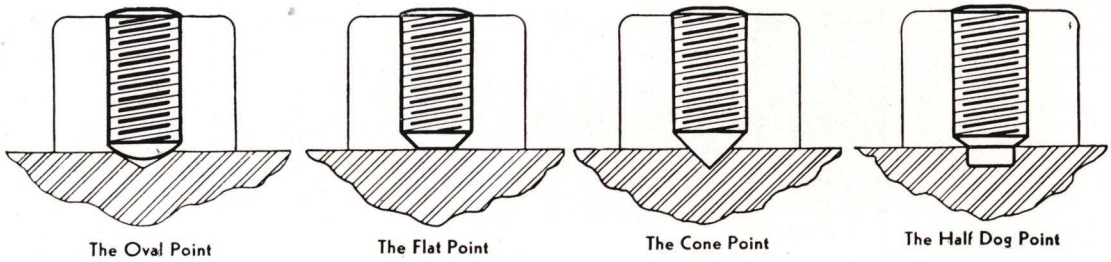


ALLEN HEX-SOCKET SET SCREWS

OVAL, FLAT, CONE, HALF DOG POINTS

N.F. (National Fine) THREADS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



The Oval Point — The Flat Point — The Cone Point — The Half Dog Point

(L) LENGTH OVER ALL — Specify Diameter First	(D) DIAMETER OF SCREWS — THREADS PER INCH													
	No. 4 .112 48 N.F.	No. 5 .125 44 N.F.	No. 6 .138 40 N.F.	No. 8 .164 36 N.F.	No. 10 .190 32 N.F.	1/4 28 N.F.	5/16 24 N.F.	3/8 24 N.F.	7/16 20 N.F.	1/2 20 N.F.	5/8 18 N.F.	3/4 16 N.F.	7/8 14 N.F.	1 14 N.F.
1/8	†3.90	†4.00	†4.10	*4.20							Box)	Box)	Box)	
3/16	4.00	4.10	4.20	4.30	4.70	*4.75								
1/4	4.10	4.20	4.30	4.40	4.75	4.80	*4.85	*4.90			per	per	per	
5/16	4.20	4.30	4.40	4.50	4.80	4.85	4.90	*4.95						
3/8	4.30	4.40	4.50	4.60	4.85	4.90	4.95	5.00	*5.90	*6.80	(100	(50	(25	
7/16	4.40	4.50	4.60	4.70	4.90	4.95	5.00	5.23	6.00	*6.90				
1/2	4.50	4.60	4.70	4.80	4.95	5.00	5.20	5.45	6.25	7.00	*9.80			
5/8	4.70	4.80	4.90	5.00	5.15	5.35	5.60	5.90	6.75	7.60	10.00	*11.90		
3/4		4.90	5.00	5.35	5.45	5.70	6.00	6.35	7.25	8.20	10.70	12.00		
7/8			5.55	5.65	5.75	6.05	6.40	6.80	7.75	8.80	11.40	12.90	15.00	
1				5.95	6.05	6.40	6.80	7.25	8.25	9.40	12.10	13.80	16.10	20.00
1 1/4					6.65	7.10	7.60	8.15	9.25	10.60	13.50	15.60	18.30	22.80
1 1/2						7.80	8.40	9.05	10.25	11.80	14.90	17.40	20.50	25.60
1 3/4						8.50	9.20	9.95	11.25	13.00	16.30	19.20	22.70	28.40
2	CLASS 3 FIT IS STANDARD FOR ALL SIZES					9.20	10.00	10.85	12.25	14.20	17.70	21.00	24.90	31.20
2 1/2								14.45	16.25	16.60	20.50	24.60	29.30	36.20
3										19.00	23.30	28.20	33.70	42.80
Add for each 1/4" length not listed (Special)	1.20	1.20	1.20	1.20	1.20	1.40	1.60	1.80	2.00	2.40	2.80	3.60	4.40	5.60
Extra Keys Each — Short Arm	.03	.03	.03	.03	.03	.03	.04	.05	.06	.07	.10	.15	.25	.35
Extra Keys Each — Long Arm	.04	.04	.04	.04	.04	.04	.05	.06	.07	.08	.12	.20	.35	.50

(*) Not offered in Cone or Half-Dog Points.

(†) Not offered in Oval, Cone or Half-Dog Points.

DIMENSIONAL DATA

OVAL POINT.....SEE PAGE 4
FLAT POINT.....SEE PAGE 5
CONE POINT.....SEE PAGE 6
HALF DOG POINT.....SEE PAGE 7

ALL ITEMS LISTED are special and are not carried in stock but are made to order at above prices in quantities of 1,000 pieces of a size (No. 4 to and including 1/2" diameter) and in quantities of 500 pieces of a size (5/8" to and including 1" diameter). For less than these quantities, prices on application.

All other diameters, lengths, threads, etc., are special. Prices on application.

DARDELET and WHITWORTH THREADS can be furnished. Prices on application.

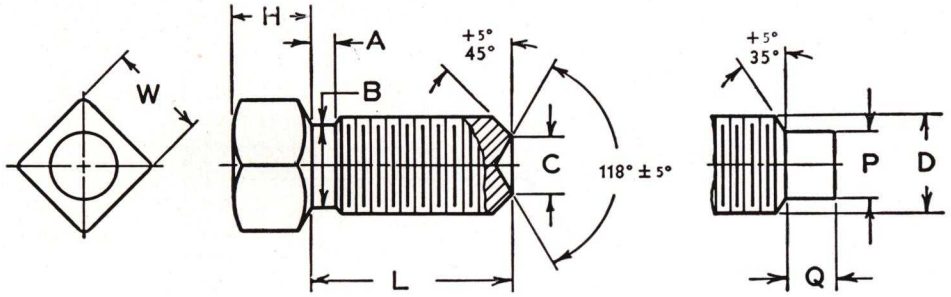
Plating extra. Prices on application.

ALLEN SQUARE HEAD SET SCREWS

STOCKED IN CUP AND FULL DOG POINTS

N. C. (National Coarse) THREADS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



(L) LENGTH UNDER HEAD — Specify Diameter First	(D) DIAMETER OF SCREWS — THREADS PER INCH												
	1/4 20 N.C.	5/16 18 N.C.	3/8 16 N.C.	7/16 14 N.C.	1/2 13 N.C.	9/16 12 N.C.	5/8 11 N.C.	3/4 10 N.C.	7/8 9 N. C.	1 8 N. C.	1 1/8 7 N. C.	1 1/4 7 N. C.	1 1/2 6 N. C.
1/2	4.30	5.35	6.45										
5/8	4.60	5.65	6.85	7.40	8.90								
3/4	4.90	5.95	7.25	7.90	9.40	11.40	12.50						
7/8	5.20	6.25	7.65	8.40	9.90	12.00	13.20						
1	5.50	6.55	8.05	8.90	10.40	12.60	13.90	17.20	21.50	40.00			
1 1/4	6.10	7.15	8.85	9.90	11.40	13.80	15.30	18.90	24.00	44.30			
1 1/2	6.70	7.75	9.65	10.90	12.40	15.00	16.70	20.60	26.50	48.60	63.00	79.50	
1 3/4	7.30	8.35	10.45	11.90	13.40	16.20	18.10	22.30	29.00	52.90	69.00	87.00	
2	7.90	8.95	11.25	12.90	14.40	17.40	19.50	24.00	31.50	57.20	75.00	94.50	156.00
2 1/4	8.50	9.55	12.05	13.90	15.40	18.60	20.90	25.70	34.00	61.50	81.00	102.00	166.50
2 1/2	9.10	10.15	12.85	14.90	16.40	19.80	22.30	27.40	36.50	65.80	87.00	109.50	177.00
2 3/4	9.70	10.75	13.65	15.90	17.40	21.00	23.70	29.10	39.00	70.10	93.00	117.00	187.50
3	10.30	11.35	14.45	16.90	18.40	22.20	25.10	30.80	41.50	74.40	99.00	124.50	198.00
3 1/4			15.25	17.90	19.40	23.40	26.50	32.50	44.00	78.70	105.00	132.00	208.50
3 1/2			16.05	18.90	20.40	24.60	27.90	34.20	46.50	83.00	111.00	139.50	219.00
3 3/4			16.85	19.90	21.40	25.80	29.30	35.90	49.00	87.30	117.00	147.00	229.50
4			17.65	20.90	22.40	27.00	30.70	37.60	51.50	91.60	123.00	154.50	240.00
4 1/2			21.25	24.90	26.40	29.40	33.50	41.00	56.50	100.20	135.00	169.50	261.00
5			24.85	28.90	30.40	34.20	36.30	44.40	61.50	108.80	147.00	184.50	282.00
5 1/2					34.40	39.00	41.90	51.20	66.50	117.40	159.00	199.50	303.00
6					38.40	43.80	47.50	58.00	71.50	126.00	171.00	214.50	324.00
6 1/2								64.80	81.50	136.00	183.00	229.50	345.00
7								71.60	91.50	146.00	195.00	244.50	366.00
7 1/2								78.40	101.50	156.00	207.00	259.50	387.00
8		CLASS 3 FIT IS STANDARD FOR ALL SIZES						85.20	111.50	166.00	219.00	274.50	408.00
8 1/2									121.50	176.00	231.00	289.50	429.00
9									131.50	186.00	243.00	304.50	450.00
10											267.00	334.50	492.00
11											291.00	364.50	534.00
12											315.00	394.50	576.00

DIMENSIONAL DATA

Width Across Flats (W)	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2
Head Height, Max. (H)	.197	.245	.293	.341	.389	.437	.485	.582	.678	.774	.870	.966	1.159
Neck Width (A)	5/64	3/32	7/64	1/8	1/8	9/64	5/32	3/16	7/32	7/32	7/32	1/4	1/4
Neck Diam., Max. (B)	.196	.252	.307	.360	.417	.472	.527	.642	.755	.865	.965	1.095	1.315
Cup Diam., Max. (C)	.132	.172	.212	.252	.291	.332	.371	.450	.530	.609	.689	.767	.926
Point Diam., Max. (P)	5/32	13/64	1/4	19/64	11/32	25/64	15/32	9/16	21/32	3/4	27/32	15/16	1 1/8
Point Length (Q)	1/8	5/32	3/16	7/32	1/4	9/32	5/16	3/8	7/16	1/2	9/16	5/8	3/4

Intermediate lengths take next longer listed size.

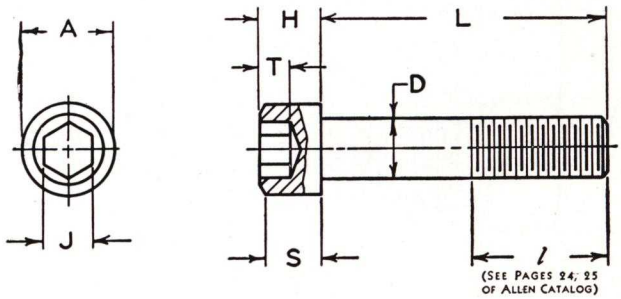
Stocked in Full Dog and Cup Points with American National Coarse (N.C.) Threads only. Can be furnished with Oval, Flat or Cone Points on special order. Prices on application.

ALLEN SOCKET HEAD CAP SCREWS

STOCKED IN STANDARD FLAT POINT ONLY

N. C. (National Coarse) THREADS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



(SEE PAGES 24, 25 OF ALLEN CATALOG)

Specify Diameter First ▶	(D) DIAMETER OF SCREWS — THREADS PER INCH													
	No. 4 .112 40 N.C.	No. 5 .125 40 N.C.	No. 6 .138 32 N.C.	No. 8 .164 32 N.C.	No. 10 .190 24 N.C.	1/4 20 N.C.	5/16 18 N.C.	3/8 16 N.C.	7/16 14 N.C.	1/2 13 N.C.	5/8 11 N.C.	3/4 10 N.C.	7/8 9 N.C.	1 8 N.C.
(L) LENGTH UNDER HEAD 1/4	4.40	4.50	4.60			(100	per	Box)		(50 per Box)		(25	per	Box)
3/8	4.60	4.70	4.80	4.90	4.90	5.25	6.25							
1/2	4.80	4.90	5.00	5.10	5.10	5.50	6.50	7.40	8.90	10.20				
5/8	5.00	5.10	5.20	5.30	5.30	5.75	6.75	7.70	9.20	10.60				
3/4	5.20	5.30	5.40	5.50	5.50	6.00	7.00	8.00	9.50	11.00				
7/8				6.00	6.00	6.50	7.50	8.50	10.00	11.75				
1				6.25	6.25	6.75	7.75	9.00	10.50	12.25	18.00			
1 1/4					7.00	7.50	8.50	10.00	11.50	13.50	19.75	20.75		
1 1/2					7.75	8.25	9.25	11.00	12.50	14.75	21.50	23.00		
1 3/4					8.50	9.00	10.00	12.00	13.50	16.00	23.25	25.25		
2					9.25	9.75	10.75	13.00	14.50	17.25	25.00	27.50	42.75	45.50
2 1/4						10.50	11.50	14.00	15.50	18.50	26.75	29.75	45.50	49.00
2 1/2						11.25	12.25	15.00	16.50	19.75	28.50	32.00	48.25	52.50
2 3/4						12.00	13.00	16.00	17.50	21.00	30.25	34.25	51.00	56.00
3						12.75	13.75	17.00	18.50	22.25	32.00	36.50	53.75	59.50
3 1/4							15.25	18.00	19.50	23.50	33.75	38.75	56.50	63.00
3 1/2							16.75	19.00	20.50	24.75	35.50	41.00	59.25	66.50
4								23.00	24.50	27.25	39.00	45.50	64.75	73.50
4 1/2		CLASS 3 FIT IS STANDARD FOR ALL SIZES						27.00		29.75	42.50	50.00	70.25	80.50
5								31.00		32.25	46.00	54.50	75.75	87.50
5 1/2										34.75	49.50	59.00	81.25	94.50
6										37.25	53.00	63.50	86.75	101.50
Add for each 1/4" length not listed (Special)	← Prices apply for 1000 or more pieces of a size →										← 500 or more pieces →			
	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.00	2.00	2.50	3.50	4.50	5.50	7.00
Extra Keys Each — Short Arm	.03	.03	.03	.03	.04	.05	.06	.10	.10	.15	.25	.35	.35	.45
Extra Keys Each — Long Arm	.04	.04	.04	.04	.05	.06	.07	.12	.12	.20	.35	.50	.50	.65

DIMENSIONAL DATA

Socket Width Across Flats (J)	5/64	3/32	3/32	1/8	5/32	3/16	7/32	5/16	5/16	3/8	1/2	9/16	9/16	5/8
Max. Head Diam. (A)	.174	.196	.217	.265	5/16	3/8	7/16	9/16	5/8	3/4	7/8	1	1 1/8	1 5/16
Max. Head Hgt. (H)	.112	.125	.138	.164	.190	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
Nom. Head Side Height (S)	.1026	.1146	.1265	.1503	.1741	.2291	.2864	.3437	.4010	.4583	.5729	.6875	.8020	.9166
Socket Depth (T)	The depth of the socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension													

ITEMS PRINTED IN BLACK are standard in ALLENOY steel and are carried in stock.

ITEMS PRINTED IN RED are special and are not carried in stock but are made to order at above prices in quantities of 1,000 pieces of a size. For less than 1,000 pieces, prices on application.

All other diameters, lengths, threads, metals, etc., are special. Prices on application.

DARDELET and WHITWORTH THREADS can be furnished. Prices on application.

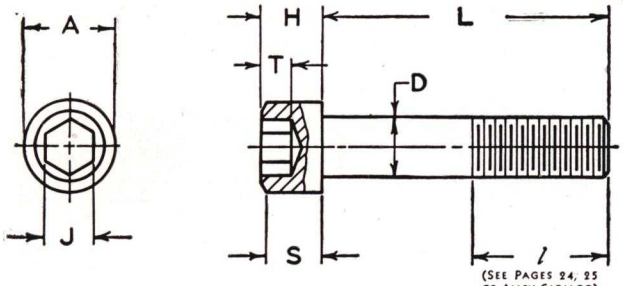
Plating extra. Prices on application.

ALLEN SOCKET HEAD CAP SCREWS

STOCKED IN STANDARD FLAT POINT ONLY

N. F. (National Fine) THREADS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



(SEE PAGES 24, 25 OF ALLEN CATALOG)

Specify Diameter First ▶	(D) DIAMETER OF SCREWS— THREADS PER INCH													
	No. 4 .112 48 N.F.	No. 5 .125 44 N.F.	No. 6 .138 40 N.F.	No. 8 .164 36 N.F.	No. 10 .190 32 N.F.	1/4 28 N.F.	5/16 24 N.F.	3/8 24 N.F.	7/16 20 N.F.	1/2 20 N.F.	5/8 18 N.F.	3/4 16 N.F.	7/8 14 N.F.	1 14 N.F.
(L) LENGTH UNDER HEAD														
1/4	4.40	4.50	4.60			(100	per	Box)		(50 per Box)		(25	per	Box)
3/8	4.60	4.70	4.80	4.90	4.90	5.25	6.25							
1/2	4.80	4.90	5.00	5.10	5.10	5.50	6.50	7.40	8.90	10.20				
5/8	5.00	5.10	5.20	5.30	5.30	5.75	6.75	7.70	9.20	10.60				
3/4	5.20	5.30	5.40	5.50	5.50	6.00	7.00	8.00	9.50	11.00				
7/8				6.00	6.00	6.50	7.50	8.50	10.00	11.75				
1				6.25	6.25	6.75	7.75	9.00	10.50	12.25	18.00			
1 1/4					7.00	7.50	8.50	10.00	11.50	13.50	19.75	20.75		
1 1/2					7.75	8.25	9.25	11.00	12.50	14.75	21.50	23.00		
1 3/4					8.50	9.00	10.00	12.00	13.50	16.00	23.25	25.25		
2					9.25	9.75	10.75	13.00	14.50	17.25	25.00	27.50	42.75	45.50
2 1/4						10.50	11.50	14.00	15.50	18.50	26.75	29.75	45.50	49.00
2 1/2						11.25	12.25	15.00	16.50	19.75	28.50	32.00	48.25	52.50
2 3/4						12.00	13.00	16.00	17.50	21.00	30.25	34.25	51.00	56.00
3						12.75	13.75	17.00	18.50	22.25	32.00	36.50	53.75	59.50
3 1/4							15.25	18.00	19.50	23.50	33.75	38.75	56.50	63.00
3 1/2							16.75	19.00	20.50	24.75	35.50	41.00	59.25	66.50
4								23.00	24.50	27.25	39.00	45.50	64.75	73.50
4 1/2		CLASS 3 FIT IS STANDARD FOR ALL SIZES						27.00		29.75	42.50	50.00	70.25	80.50
5								31.00		32.25	46.00	54.50	75.75	87.50
5 1/2										34.75	49.50	59.00	81.25	94.50
6										37.25	53.00	63.50	86.75	101.50
Add for each 1/4" length not listed (Special)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.00	2.00	2.50	3.50	4.50	5.50	7.00
Extra Keys Each — Short Arm	.03	.03	.03	.03	.04	.05	.06	.10	.10	.15	.25	.35	.35	.45
Extra Keys Each — Long Arm	.04	.04	.04	.04	.05	.06	.07	.12	.12	.20	.35	.50	.50	.65

DIMENSIONAL DATA

Socket Width Across Flats (J)	5/64	3/32	3/32	1/8	5/32	3/16	7/32	5/16	5/16	3/8	1/2	9/16	9/16	5/8
Max. Head Diam. (A)	.174	.196	.217	.265	5/16	3/8	7/16	9/16	5/8	3/4	7/8	1	1 1/8	1 5/16
Max. Head Hgt. (H)	.112	.125	.138	.164	.190	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
Nom. Head Side Height (s)	.1026	.1146	.1265	.1503	.1741	.2291	.2864	.3437	.4010	.4583	.5729	.6875	.8020	.9166
Socket Depth (T)	The depth of the socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension													

ITEMS PRINTED IN BLACK are standard in ALLENOY steel and are carried in stock.

ITEMS PRINTED IN RED are special and are not carried in stock but are made to order at above prices in quantities of 1,000 pieces of a size (No. 4 to and including 1/2" diameter) and in quantities of 500 pieces of a size (5/8" to and including 1" diameter). For less than these quantities, prices on application.

All other diameters, lengths, threads, metals, etc., are special. Prices on application.

DARDELET and WHITWORTH THREADS can be furnished. Prices on application.

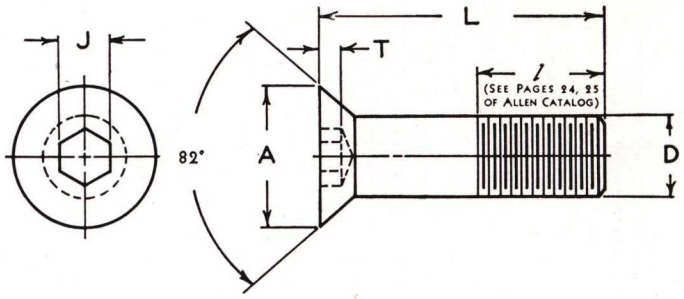
Plating extra. Prices on application.

Allen Hex-Socket Flat Head Cap Screws

STOCKED IN STANDARD FLAT POINT ONLY

N. C. (National Coarse) and N. F. (National Fine) Threads

LIST PRICES PER 100 (2 Keys with each 100 Screws)



Specify Diameter First	(D) DIAMETER OF SCREWS — THREADS PER INCH										
	No. 4 .112 40 N.C. 48 N.F.	No. 6 .138 32 N.C. 40 N.F.	No. 8 .164 32 N.C. 36 N.F.	No. 10 .190 24 N.C. 32 N.F.	1/4 20 N.C. 28 N.F.	5/16 18 N.C. 24 N.F.	3/8 16 N.C. 24 N.F.	7/16 14 N.C. 20 N.F.	1/2 13 N.C. 20 N.F.	5/8 11 N.C. 18 N.F.	3/4 10 N.C. 16 N.F.
(L) LENGTH OVER ALL 1/4	5.15	5.35			(100	per	Box)		(50 per Box	(25 per Box)	
3/8	5.35	5.55	5.65	5.75	6.00	6.75					
1/2	5.55	5.75	5.85	5.95	6.25	7.00	7.25				
5/8	5.75	5.95	6.05	6.15	6.50	7.25	7.75				
3/4	5.95	6.15	6.25	6.35	6.75	7.50	8.50	10.00	11.50		
1			6.55	7.10	7.50	8.50	9.75	11.75	13.00		
1 1/4				7.85	8.25	9.25	10.75	12.75	14.25	20.50	21.50
1 1/2				8.50	9.00	10.00	11.75	13.00	15.25	22.00	23.50
1 3/4					9.75	10.75	12.75	14.25	16.75	24.00	26.00
2					10.50	11.50	13.75	15.25	18.00	25.75	28.25
2 1/4		CLASS 3 FIT IS STANDARD FOR ALL SIZES				12.25	14.75	16.25	19.25	27.25	30.50
2 1/2						13.00	15.75	17.25	20.50	29.25	32.75
2 3/4							16.75	18.25	21.75	31.00	35.00
3							17.75	19.25	23.00	32.75	37.25
Add for each 1/4" length not listed (Special)	Prices apply for 1000 or more pieces of a size									500 or more	
	1.50	1.50	1.50	1.50	1.50	2.00	2.00	2.50	3.50	4.50	5.50
Extra Keys Each — Short Arm	.03	.03	.03	.03	.04	.05	.06	.07	.10	.15	.15
Extra Keys Each — Long Arm	.04	.04	.04	.04	.05	.06	.07	.08	.12	.20	.20

DIMENSIONAL DATA

Socket Width Across Flats (J)	1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	3/8
Max. Head Diam. (A)	.223	.270	.317	.375	.500	.625	.750	.812	.875	1.125	1.375
Socket Depth (T)	The depth of the socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension										

ITEMS LISTED are standard in ALLENOY steel and are carried in stock in both American National Coarse (N.C.) and American National Fine (N.F.) Threads.

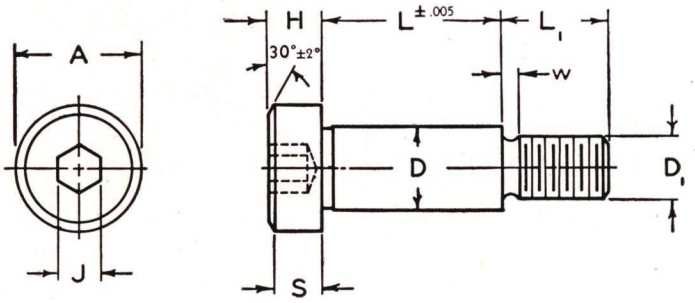
All other diameters, lengths, threads, metals, etc., are special. Prices on application.

DARDELET and WHITWORTH THREADS can be furnished. Prices on application.

Plating extra. Prices on application.

ALLEN TRU-GROUND SHOULDER SCREWS

LIST PRICES PER 100 (2 Keys with each 100 Screws)



Specify Diameter First ▶	(D) DIAMETER OF SHOULDER						
SHOULDER LENGTH (L)	1/4	5/16	3/8	1/2	5/8	3/4	1
3/4	7.50	8.50					
1	8.25	9.25	11.25	15.35			
1 1/4	9.00	10.00	12.50	16.90	24.70		
1 1/2	9.75	10.75	13.75	18.45	26.90	28.80	
1 3/4	10.50	11.50	15.00	20.00	29.10	31.60	
2	11.25	12.25	16.25	21.55	31.25	34.40	57.40
2 1/4	12.00	13.00	17.50	23.10	33.45	37.25	61.50
2 1/2	12.75	13.75	18.75	24.70	35.60	40.05	65.55
2 3/4	13.50	14.25	20.00	26.25	37.85	42.85	69.60
3	15.00	16.75	21.25	27.80	40.00	45.65	73.65
3 1/4			22.50	29.35	42.20	48.45	77.70
3 1/2			23.75	30.95	44.40	51.25	81.75
3 3/4			25.00	32.50	46.60	54.10	85.85
4			26.25	34.05	48.75	56.90	89.90
4 1/4				35.60	50.95	59.75	94.00
4 1/2				37.20	53.15	62.55	98.05
4 3/4				38.75	55.35	65.35	102.10
5				40.30	57.50	68.15	106.15
5 1/2		CLASS 3 FIT IS STANDARD FOR ALL SIZES			61.90	73.80	116.80
6					66.25	79.40	127.40
6 1/2						90.65	143.65
7						101.90	159.90
Extra Keys Each — Short Arm	.03	.04	.05	.07	.10	.15	.25
Extra Keys Each — Long Arm	.04	.05	.06	.08	.12	.20	.35

DIMENSIONAL DATA

Socket Width Across Flats (J)	1/8	5/32	3/16	1/4	5/16	3/8	1/2
Max. Head Diam. (A)	3/8	7/16	9/16	3/4	7/8	1	1 5/16
Max. Head Hgt. (H)	3/16	7/32	1/4	5/16	3/8	1/2	5/8
Max. Head Side Hgt. (S)	.1641	.1899	.2155	.2668	.3181	.4341	.5366
Nom. Thd. Diam. (D_1)	No. 10-24	1/4-20	5/16-18	3/8-16	1/2-13	5/8-11	3/4-10
Nom. Thd. Lgth. (L_1)	3/8	7/16	1/2	5/8	3/4	7/8	1
Neck Width (w)	5/64	5/64	5/64	3/32	1/8	5/32	5/32

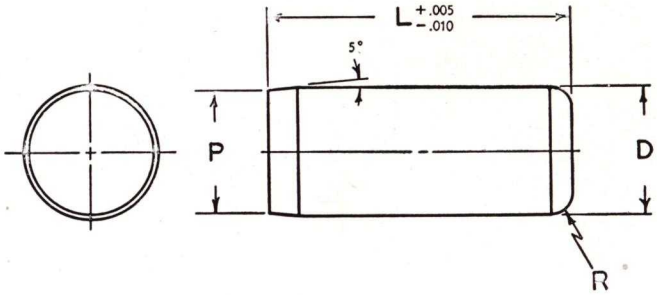
ITEMS PRINTED IN BLACK are standard in ALLENOY steel and are carried in stock.

ITEMS PRINTED IN RED are not carried in stock, but are made to order in coarse or fine threads, at above prices in quantities of one thousand pieces of a size for 1/4" and 5/16" diameters and five hundred pieces of a size for 1" diameter. For less than these quantities, prices on application.

Sizes other than listed can be furnished. Prices on application.

ALLEN TRU-GROUND DOWEL PINS

LIST PRICES PER 100



Specify Diameter First ▶	(D) DIAMETER OF DOWEL PINS										
(L) LENGTH OVER ALL	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
3/8	5.00										
1/2	5.10	5.40	5.60	7.10	7.75	8.75					
5/8	5.20	5.55	5.70	7.30	8.30	8.90	10.40	(25	per	Box)	(12 per Box)
3/4	5.40	5.70	5.85	7.50	8.35	9.15	10.80				
7/8	5.70	6.25	6.50	7.65	8.50	9.60	11.20				
1	5.85	6.65	7.10	7.90	8.75	10.00	11.60	14.60			
1 1/4	6.25	6.85	7.50	9.15	10.00	10.80	12.50	15.85			
1 1/2	6.65	7.50	8.35	10.40	11.25	11.65	12.90	16.60			
1 3/4	8.10	8.35	9.15	12.10	12.50	13.35	14.20	18.75			
2	8.85	9.15	10.40	13.35	13.70	15.00	15.40	20.85	26.25	37.00	46.00
2 1/4			12.00	15.00	15.40	16.25	17.50	22.60	28.10	38.50	50.00
2 1/2			13.70	15.85	16.70	17.50	18.75	25.00	32.10	40.00	54.00
2 3/4				16.30	17.90	18.15	20.40	26.10	33.80	42.40	58.50
3				17.30	18.75	21.00	22.10	28.75	38.35	46.70	63.00
3 1/4				19.60	19.70	22.20	23.95	30.55	43.15	50.00	66.50
3 1/2				20.40	20.75	23.40	25.85	32.50	45.00	53.35	70.00
3 3/4		(100	per	Box)	22.25	24.60	27.00	34.35	48.10	57.90	75.00
4						25.80	28.35	36.25	51.25	62.50	80.00
4 1/4					(50 per Box)			37.50	54.55	64.60	84.00
4 1/2								39.50	58.00	70.75	88.00
4 3/4								41.50	61.05	74.00	92.00
5								43.50	64.10	78.00	96.00
5 1/4									67.25	82.50	100.00
5 1/2									70.40	87.00	104.00
5 3/4									73.50	91.00	108.00
6									76.60	95.00	112.00

DIMENSIONAL DATA

		1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
Diameter (D) of .0002 over Basic Size Pin	Max.	.1253	.1878	.2503	.3128	.3753	.4378	.5003	.6253	.7503	.8753	1.0003
	Min.	.1251	.1876	.2501	.3126	.3751	.4376	.5001	.6251	.7501	.8751	1.0001
Diameter (D) of .001 over Basic Size Pin	Max.	.1261	.1886	.2511	.3136	.3761	.4386	.5011	.6261	.7511	.8761	1.0011
	Min.	.1259	.1884	.2509	.3134	.3759	.4384	.5009	.6259	.7509	.8759	1.0009
Point Diam. (P)		.119	.176	.239	.301	.364	.4205	.483	.608	.728	.853	.978
Top Radius (R)		3/64	3/64	1/16	1/16	5/64	3/32	7/64	1/8	1/8	1/8	1/8

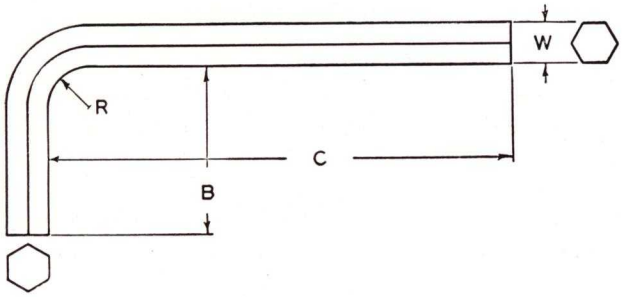
Above listed items are standard and carried in stock. All other diameters and lengths are special. Prices on application.

All pins are made in two sizes, .0002 and .001 over basic sizes. Unless otherwise specified the .0002 over-size will be furnished.

ALLEN HEXAGONAL KEYS

IMPORTANT
When ordering keys, specify code number.

LIST PRICES EACH



		WIDTH ACROSS FLATS (W) OF HEXAGONAL KEYS															
		.050	1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	9/16	5/8	3/4	1
Short Arm Series	Code No.	050	116	564	332	18	532	316	732	14	516	38	12	916	58	34	100
	Price Each	.03	.03	.03	.03	.03	.04	.05	.06	.07	.10	.15	.25	.35	.45	.65	1.05
Long Arm Series	Code No.	050L	116L	564L	332L	18L	532L	316L	732L	14L	516L	38L	12L	916L	58L	34L	100L
	Price Each	.04	.04	.04	.04	.04	.05	.06	.07	.08	.12	.20	.35	.50	.65	.95	1.65

DIMENSIONAL DATA

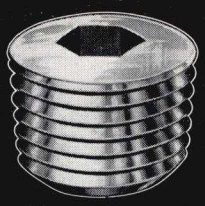
Max. Length of Short Arm (B)	21/32	21/32	45/64	3/4	27/32	15/16	1 1/32	1 1/8	1 7/32	1 11/32	1 15/32	1 23/32	1 27/32	1 31/32	2 7/32	2 23/32
Max. Length of Long Arm (C), Short Series	1 27/32	1 27/32	1 31/32	2 3/32	2 11/32	2 19/32	2 27/32	3 3/32	3 11/32	3 27/32	4 11/32	5 11/32	5 27/32	6 11/32	7 11/32	9 11/32
Max. Length of Long Arm (C), Long Series					3 27/32	4 7/32	4 19/32	4 31/32	5 11/32	6 3/32	6 27/32	8 11/32	9 3/32	9 27/32	11 11/32	14 11/32
Radius of Bend (R)	1/16	1/16	5/64	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	1/2	9/16	5/8	3/4	1

Short arm series furnished unless otherwise specified.

Packaging: .050″ to and including 3/16″ — 100 per box; 7/32″ to and including 5/16″ — 50 per box; 3/8″ to and including 1″ — 25 per box.

INTERCHANGEABILITY TABLE

Key Width Across Flats (W)	Screw Diameter				
	Set	Socket Head Cap	Flat Head Cap	Shoulder	Pipe Plug
.050 fits 1/16 "	No. 4 No. 5-6		No. 4		
5/64 " 3/32 "	No. 8 No. 10	No. 4 No. 5-6	No. 6 No. 8		
1/8 " 5/32 "	1/4 5/16	No. 8 No. 10	No. 10 1/4	1/4 5/16	
3/16 " 7/32 "	3/8 7/16	1/4 5/16	5/16 3/8	3/8	1/8
1/4 " 5/16 "	1/2 5/8	3/8, 7/16	7/16 1/2	1/2 5/8	1/4 3/8
3/8 " 1/2 "	3/4 7/8	1/2 5/8	5/8, 3/4	3/4 1	1/2
9/16 " 5/8 "	1, 1 1/8 1 1/4	3/4, 7/8 1			3/4 1
3/4 " 1 "	1 1/2	1 1/8, 1 1/4 1 1/2			

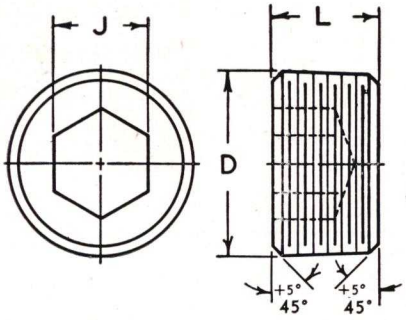


ALLEN HEX-SOCKET PIPE PLUGS

LIST PRICES PER 100 (2 Keys with each 100 Plugs)

Briggs Standard Pipe Thread	1/8	1/4	3/8	1/2	3/4	1
	$5.00	$7.00	$10.00	$12.00	$20.00	$30.00

Packaging: 1/8 to and including 1/2 — 100 per box; 3/4 and 1 — 50 per box.

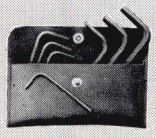


DIMENSIONAL DATA

Nom. Diam. (D) Large End	.405	.540	.675	.840	1.050	1.315
Length (L)	3/8	7/16	1/2	9/16	5/8	3/4
Socket Width Across Flats (J)	3/16	1/4	5/16	3/8	9/16	5/8
Threads per Inch	27	18	18	14	14	11 1/2

No. 607

No. 609



No. 604

Tap Extensions

Nos. 603 & 614

ALLEN "T" HANDLE KEYS (No. 609)

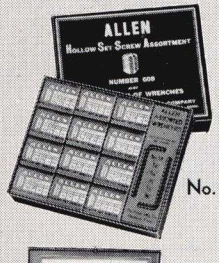
(When ordering, specify code number)

Size of Hex.	Code No.	Lengths of Blades	Screw Diameter		List Price Each	List Price Extra Blades Ea.
			Set	Cap		
3/32	332T	3, 4, 5	No. 10	Nos. 5 & 6	$1.00	$ .03
1/8	18T	3, 4, 5	1/4	No. 8	1.00	.03
5/32	532T	3, 4, 5	5/16	No. 10	1.10	.04
3/16	316T	4, 5, 6	3/8	1/4	1.25	.05
7/32	732T	4, 5, 6	7/16	5/16	1.35	.06
1/4	14T	4, 5, 6	1/2		1.50	.07
5/16	516T	5, 6, 7	5/8	3/8 & 7/16	1.60	.10
3/8	38T	5, 6, 7	3/4	1/2	1.70	.15
1/2	12T	6, 7, 8	7/8	5/8	1.75	.25
9/16	916T	6, 7, 8	1 & 1 1/8	3/4 & 7/8	2.00	.35
5/8	58T	6, 7, 8	1 1/4	1	2.25	.45

Prices include three reversible, renewable blades of lengths shown.

ALLEN TAP EXTENSIONS

Tap Size	Size of Square of Tap Shank	Size of Hole in Tap Extension	List Price Set of 2 Pieces
1/4	.191	.192	$2.00
5/16	.238	.240	2.25
3/8	.206	.208	2.25
3/8	.286	.288	2.50
7/16	.242	.244	2.25
1/2	.275	.277	2.50
5/8	.360	.362	3.00
3/4	.442	.444	3.50
7/8	.523	.525	4.00
1	.600	.603	5.00



No. 608

No. 602

No. 615

ALLEN SCREWDRIVER KEYS (No. 607)

(When ordering, specify code number)

Size of Hex.	Code No.	Length Overall	Screw Diameter		List Price Each	List Price Extra Blades Ea.
			Set	Cap		
.050	050S	5 1/4	No. 4		$1.00	$ .03
1/16	116S	5 1/4	Nos. 5 & 6		1.00	.03
5/64	564S	5 1/4	No. 8	No. 4	1.00	.03
3/32	332S	5 1/4	No. 10	Nos. 5 & 6	1.15	.03
1/8	18S	5 1/4	1/4	No. 8	1.15	.03
5/32	532S	5 3/4	5/16	No. 10	1.25	.04
3/16	316S	5 3/4	3/8	1/4	1.25	.05

Prices include three reversible, renewable blades of same length.

ALLEN KEY SETS and ASSORTMENTS

		List Price
No. 602	Boxed Set Screw Assortment	$ 33.80
No. 603	Short Arm Key Kit	1.75
No. 604	Junior Key Kit (Short Arm)	.50
No. 608	Set Screw Assortment	8.18
No. 614	Long Arm Key Kit	2.50
No. 615	"Key Island"	2.35

All dimensions shown in this price list are in inches.

Prices subject to change without notice.

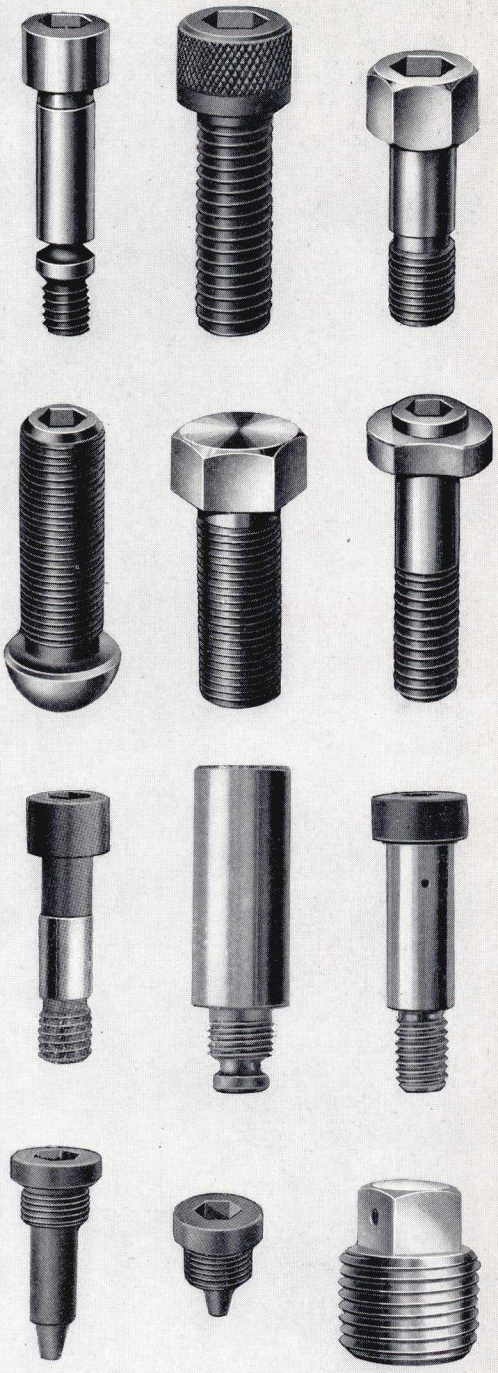
Allen SPECIAL SCREWS

Hollow screw applications have rapidly outgrown the conventional range of standard shapes and sizes, to an extent commensurate with the advantages of the hexagon-hole principle over any other means of applying torsional pressure to a holding part. Special types of hollow screws are as diversified as the ideas of machine designers in attaining more compact constructions and more accessible adjustments.

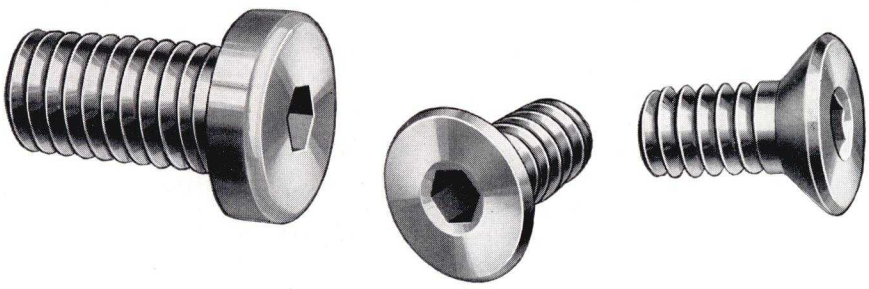
Requisitions for these special types come to "Hollow Screw Headquarters" as a matter of course and in quantity which has necessitated the creation of a "specials" department. This department is equipped, personally and mechanically, to provide all manner of hollow screws and to produce them with the accuracy and uniformity which characterizes the standard Allen product. The operations of this department include engineering consulting service by a staff ready and competent to cooperate in the working out of original, unusual and intricate applications.

Nor is this special department limited to the production of hollow screws. *Any* special product embodying the principle of the hexagon socket is eligible to prompt and competent attention by Allen engineers and to production by Allen processes, provided the dimensions are within the capacity of Allen equipment. Such products may be had in ALLENOY steel or any other workable metal.

Illustrated at the right are a few Allen special products, chosen at random from hundreds of types equally intricate and exacting.

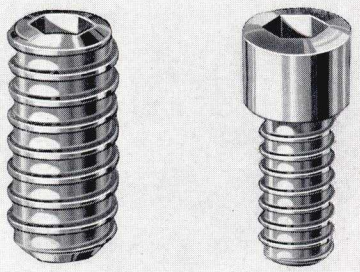


HOLLOW SCREWS FOR TEXTILE MACHINERY



To cut losses from pulled threads, Allen has developed these special hollow screws for textile machines. Heads set perfectly flush with machine surfaces. There are no sharp edges to catch fabrics; screws are chamfered at the point, outside edge of head and top edge of socket. No slots to burr. The internally-operated hex key sets the screw easily, quickly and *tightly* without slippage. Write for information on "Allens" to meet your particular textile machine requirements.

DARDELET THREADS



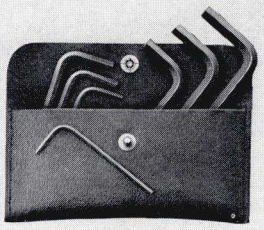
Allen is prepared to supply, on special order, set and cap screws with the patented Dardelet threads which feature a self-locking action when the screw is tightened. Made by Allen under license from the Dardelet Threadlock Corporation.

Allen

SPECIAL KEYS, KEY SETS HOLLOW SCREW ASSORTMENTS

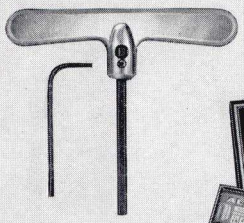
FOR SPEED AND CONVENIENCE IN ASSEMBLY

No. 607

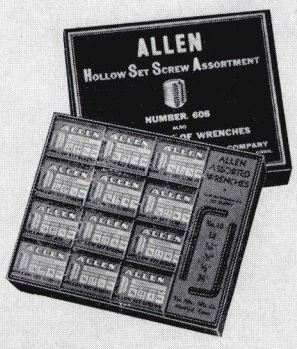


No. 604

Nos. 603 and 614



No. 609



No. 608

No. 602

No. 607 Allen Screwdriver Style Keys

Where work is continuous in small sizes of hollow screws, this shaped-to-the-hand key will pay for itself many times over in cutting assembly costs. Patented chuck holds blade firmly. Three reversible, renewable blades of same length (with ends ground for easy insertion in the hex hole) are supplied with each unit. Sizes given with prices in center section price list.

No. 604 Allen Junior Key Kit

Seven Short Arm Allen Keys are included in this strong leatherette envelope. They fit Nos. 8, 10, 1/4", 5/16", 3/8", 7/16" and 1/2" set screws and Nos. 4, 5, 6, 8, 10, 1/4" and 5/16" cap screws.

No. 603 Allen Short Arm Key Kit

This handy container, made of canvas with pockets for individual keys, has a complete set of 11 short arm keys which fit all screws from and including No. 10 up to and including 1 1/4" diameter set screws.

No. 614 Allen Long Arm Key Kit

Same as No. 603 but with long arm keys.

No. 609 Allen "T" Handle Keys

For combined speed and convenience in assembly, these Allen "T" Handle Keys fit the need — inexpensively. Reversible, renewable blades of heat-treated steel are held securely in the handle by an Allen Set Screw. Three blades of assorted lengths furnished with each handle. Sizes given with prices in center section price list.

Allen No. 608 Set Screw Assortment

Popularly used in tool cribs, home work shops, service stations, garages and in the home. Contains the following set screws (cup point):

Quantity	Diameter	Length
10	No. 10	3/16"
10	No. 10	1/4"
10	1/4"	1/4"
10	1/4"	3/8"
10	5/16"	5/16"
10	5/16"	3/8"
10	3/8"	3/8"
10	3/8"	1/2"
10	1/2"	1/2"
10	1/2"	5/8"
10	5/8"	5/8"
5	5/8"	1"

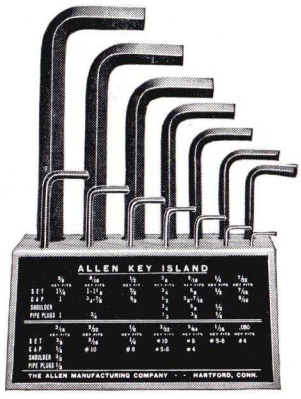
Two keys each included for No. 10, 1/4", 5/16", 3/8" and 1/2" set screws. One key for 5/8" set screws.

No. 602 Allen Boxed Screw Assortment

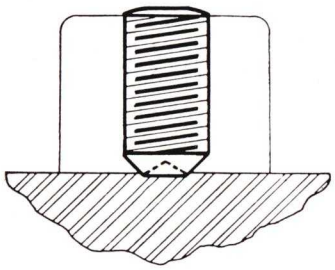
A most complete assortment of Allen Hollow Set Screws with keys to fit. Packed in compartment box, with diagram inside of cover listing the contents. Contains 590 set screws ranging from 10-32 x 3/16" to 5/8" x 5/8" and 115 keys to fit.

No. 615 Allen Key Island

Especially designed for the workbench, this handy key set contains 14 keys fitting all sizes of set screws up to and including 1 1/4"; cap screws up to and including 1"; flat head cap screws up to and including 3/4"; shoulder screws up to and including 1" and pipe plugs up to and including 1". The container is plainly labeled to show the correct size key to use with each screw. Price in center section price list.

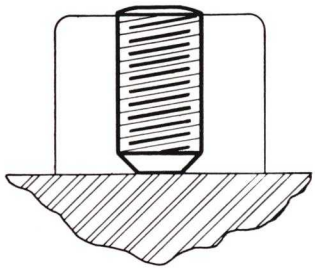


THE CORRECT USES FOR EACH STYLE OF SET SCREW POINT



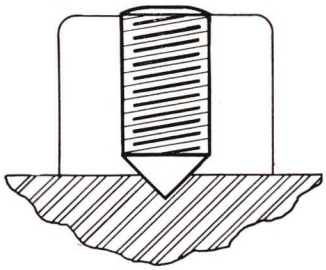
The Cup Point

The cup point set screw is by far the most commonly used. As a rule, it is employed where the quick and, more or less permanent location of pulleys, collars, etc., on soft shafts is required. It may also be used for any other application where semi-permanent location of machine parts is required and the cutting in of the sharp edges of the cup point is not objectionable. It should not be used against shafts or other parts which have been hardened; the flat point is better adapted for this purpose. The cup point is seldom spotted in; other types of points are better adapted for this.



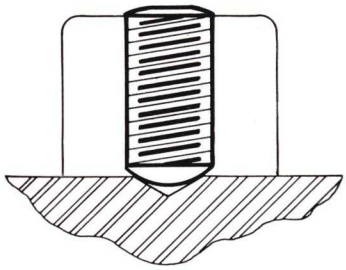
The Flat Point

The flat point set screw is usually employed where frequent resetting of one machine part in relation to another is required, with the least possible damage to that part against which the point of the screw bears. It is particularly adapted for use against steel shafts, or other steel parts which have been hardened. It is also often used for the adjustment of gibs in machine slides. Other types are better adapted, however, if the point is to be spotted in.



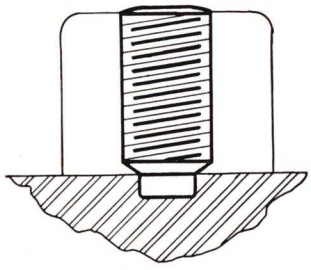
The Cone Point

The cone point set screw is especially adapted to applications where the permanent location of one machine part in relation to another is desired. For example: the location of a collar or a pulley on a shaft which may be either hard or soft. The cone point should always be spotted into the part against which it bears; moreover, the included angles of spot and point should closely coincide in order that full efficiency may be attained. Cone point set screws may also be employed to advantage in pivot applications.



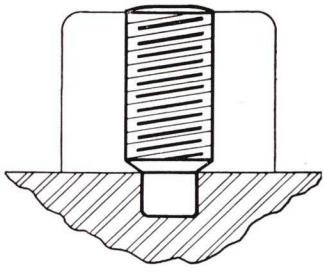
The Oval Point

The oval point set screw may be employed as a substitute for the cup point, but if conditions will permit, the oval point should be seated by spotting into the part against which it bears. The oval point is also especially desirable where frequent adjustment must be made. This advantage is particularly apparent in cases where a groove may be cut for the reception of the point of the screw in the part against which it bears. Such a groove should, of course, be of the same general contour as the point of the screw, and may be cut either annular, lengthwise, or in any other direction with reference to the surface of the part involved.



The Half Dog Point

The half dog point set screw is primarily intended for applications involving the permanent location of one machine part in relation to another. A hole should always be drilled for the reception of the point and not larger in diameter than that of the latter; otherwise, undue play combined with excessive vibration will tend to wear the hole to an elliptical shape and the solidity of the connection will be nullified. On the whole, the cone point, properly seated, will be found to be much more efficient for the permanent location of machine parts. The half dog point may also be employed for the same types of application as the flat point, and in some instances should be found preferable to the latter.

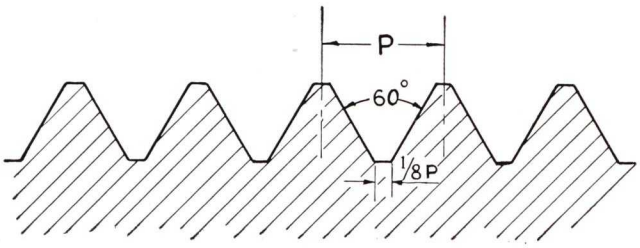


The Full Dog Point

The full dog point set screw is intended for exactly the same types of application as the half dog point, and the details of its installation should be similarly observed. However, the full dog point set screw is not very extensively used because its efficiency is not appreciably greater than that of the half dog point. For that reason, full dog point set screws are not carried in regular stock, but if for any reason this type is required, we are prepared to furnish them upon special order.

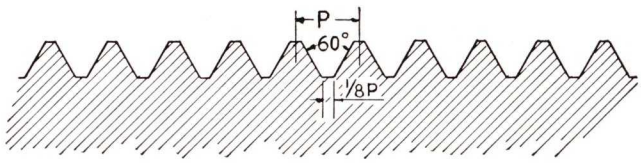
American National Coarse Thread (N.C.)

For this form, the sides of the thread form an angle of 60° with each other. The thread is flattened at top and bottom, the width of the flat being equal to one-eighth of the pitch. The American Coarse (N. C.) thread is recommended for general use in engineering work, in machine construction where conditions are favorable to the use of screws where quick and easy assembly of the parts is desired, and for all work where conditions do not require the use of fine pitch threads.



American National Fine Thread (N.F.)

This thread is of the same form as the American Coarse (N. C.). It is recommended for general use in automotive and aircraft work, for use where the design requires both strength and reduction in weight, and where special conditions require a fine thread such as on large sizes where sufficient force cannot be secured by the use of a short wrench to set properly a screw of coarse pitch. Fine pitch screws do not work loose so easily under vibration because of the comparatively low helix angle. They also have increased strength due to increased root (minor) diameters.



COARSE THREAD SERIES (CLASS 3)

1	2	3	4	5	6	7	8	9	10
Size	Threads Per Inch	Major Diameter			Pitch Diameter			Maximum[2] Minor Diam. (Inches)	Drill Size
		Maximum[1] (Inches)	Tolerance (Inches)	Minimum (Inches)	Maximum[1] (Inches)	Tolerance[3] (Inches)	Minimum (Inches)		
4	40	.1120	.0048	.1072	.0958	.0017	.0941	.0813	43
5	40	.1250	.0048	.1202	.1088	.0017	.1071	.0943	38
6	32	.1380	.0054	.1326	.1177	.0019	.1158	.0997	36
8	32	.1640	.0054	.1586	.1437	.0019	.1418	.1257	29
10	24	.1900	.0066	.1834	.1629	.0024	.1605	.1389	25
1/4	20	.2500	.0072	.2428	.2175	.0026	.2149	.1887	7
5/16	18	.3125	.0082	.3043	.2764	.0030	.2734	.2443	F
3/8	16	.3750	.0090	.3660	.3344	.0032	.3312	.2983	5/16"
7/16	14	.4375	.0098	.4277	.3911	.0036	.3875	.3490	U
1/2	13	.5000	.0104	.4896	.4500	.0037	.4463	.4056	27/64"
5/8	11	.6250	.0118	.6132	.5660	.0042	.5618	.5135	17/32"
3/4	10	.7500	.0128	.7372	.6850	.0045	.6805	.6273	21/32"
7/8	9	.8750	.0140	.8610	.8028	.0049	.7979	.7387	49/64"
1	8	1.0000	.0152	.9848	.9188	.0054	.9134	.8466	7/8"

FINE THREAD SERIES (CLASS 3)

1	2	3	4	5	6	7	8	9	10
Size	Threads Per Inch	Major Diameter			Pitch Diameter			Maximum[2] Minor Diam. (Inches)	Drill Size
		Maximum[1] (Inches)	Tolerance (Inches)	Minimum (Inches)	Maximum[1] (Inches)	Tolerance[3] (Inches)	Minimum (Inches)		
4	48	.1120	.0044	.1076	.0985	.0016	.0969	.0864	42
5	44	.1250	.0046	.1204	.1102	.0016	.1086	.0971	37
6	40	.1380	.0048	.1332	.1218	.0017	.1201	.1073	33
8	36	.1640	.0050	.1590	.1460	.0018	.1442	.1299	29
10	32	.1900	.0054	.1846	.1697	.0019	.1678	.1517	21
1/4	28	.2500	.0062	.2438	.2268	.0022	.2246	.2062	3
5/16	24	.3125	.0066	.3059	.2854	.0024	.2830	.2614	I
3/8	24	.3750	.0066	.3684	.3479	.0024	.3455	.3239	Q
7/16	20	.4375	.0072	.4303	.4050	.0026	.4024	.3762	25/64"
1/2	20	.5000	.0072	.4928	.4675	.0026	.4649	.4387	29/64"
5/8	18	.6250	.0082	.6168	.5889	.0030	.5859	.5568	37/64"
3/4	16	.7500	.0090	.7410	.7094	.0032	.7062	.6733	11/16"
7/8	14	.8750	.0098	.8652	.8286	.0036	.8250	.7874	13/16"
1	14	1.0000	.0098	.9902	.9536	.0036	.9500	.9124	15/16"

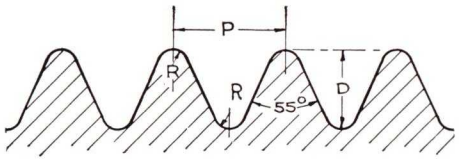
[1] Basic diameter.

[2] Dimensions given are figured to intersection of the worn tool arc with a centerline through crest and root. Minimum flat at root equals 1/8 x p.

[3] The tolerances specified for pitch diameter include all errors of pitch diameter, lead, and angle.

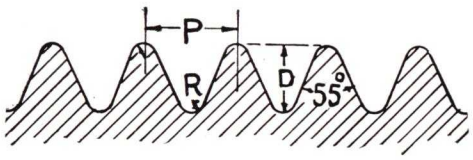
British Standard Whitworth Thread (B.S.W.)

For this form, the sides of the thread form an angle of 55° with each other and the depth of the thread is equal to .06043 times the pitch. The crest and root of the thread are rounded to a radius equal to .1373 times the pitch. This thread has been adopted as a standard by The British Standards Institution. It is recommended for the same applications as The American Standard Coarse (N. C.) Thread.



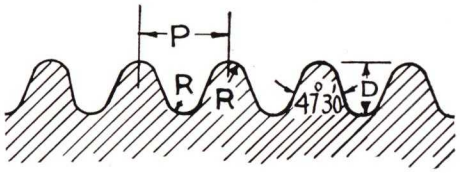
British Standard Fine Thread (B.S.F.)

This thread is of the same form as the British Standard Coarse (B. S. W.) Thread. It has been adopted as a standard by The British Standards Institution and is recommended for the same types of applications as The American Standard Fine (N. F.) Thread.



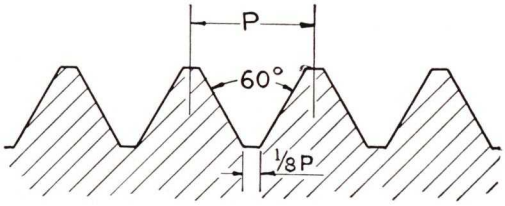
British Association Thread (B.A.)

For this form, the sides of the thread form an angle of 47° 30′ with each other. The root and crest of the thread are both rounded with a radius equal to 2/11 p. The depth of the thread resulting is equal to 3/5 p. This thread has been adopted as a standard by The British Standards Association and is recommended for screws under ¼″ in diameter. An exception is the 7/32 British Standard Fine (B. S. F.) size, which is slightly smaller than the No. 0 B.A. and should be used as a continuation of the B. S. F. series in preference to the No. 0 B. A.



International (Metric) Standard Thread (S.I.)

This thread is of the same form as The American Standard Coarse (N. C.). The thread was adopted by an International Congress for the Unifying of Screw Threads, held in Zurich in 1898. It is recommended for the same type of applications as the American Standard Coarse (N. C.).



THREAD FITS

Class 1, Loose Fit:

The loose-fit class is intended to cover manufacture of threaded parts where quick and easy assembly is necessary and a considerable amount of shake or play is not objectionable. This class also provides allowance to permit ready assembly even when threads are slightly bruised or dirty.

Class 2, Free Fit:

The free-fit class is intended to apply to interchangeable manufacture where the threaded members are to assemble nearly, or entirely, with the fingers where a moderate amount of shake or play between the assembled threaded members is not objectionable, and where no allowance for bruised or dirty threads is required. This class includes the great bulk of fastening screws.

*Class 3, Medium Fit:

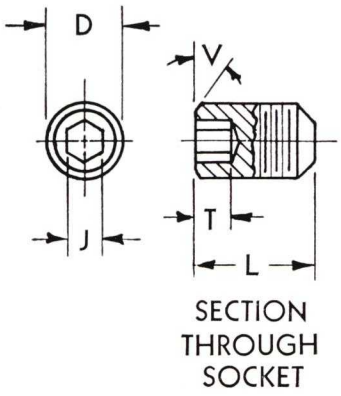
The medium-fit class is intended to apply to the manufacture of the higher grade of threaded parts which are to assemble nearly, or entirely, with the fingers and must have the minimum amount of shake or play between the threaded members. It is the same in every particular as the Class 2, free-fit except that the tolerances are smaller.

Class 4, Close Fit:

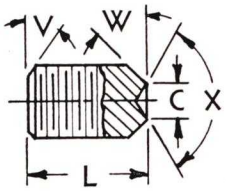
The close-fit class is intended for threaded work of the finest commercial quality where very little shake or play is permissible, and where a screwdriver or key may be necessary for assembly. In the manufacture of screw thread products belonging to this class it is necessary to use precision tools, selected gages, and other refinements. This class of fit should, therefore, be used *only* in cases where requirements of the mechanism being produced require screws having a precision fit. In order to secure the fit desired, it may be necessary in some instances to select properly mating members when the product is being assembled.

* Standard Allen Screws are manufactured regularly to CLASS 3, MEDIUM FIT. Screws will be manufactured to Class 1, 2 and 4 fits upon special order only.

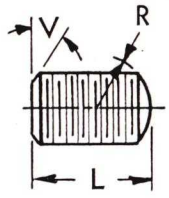
DIMENSIONS — HOLLOW SET SCREWS



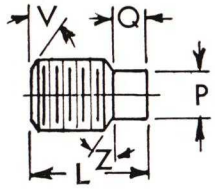
SECTION THROUGH SOCKET



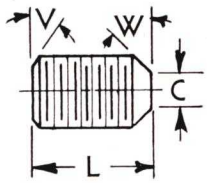
CUP POINT



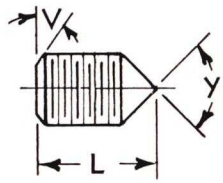
OVAL POINT



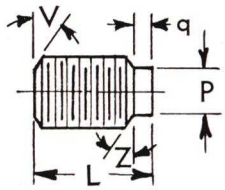
FULL DOG POINT



FLAT POINT



CONE POINT



HALF DOG POINT

TABLE 1 DIMENSIONS OF HOLLOW SET SCREWS

D	C			R	Y		P		Q	q	J	
Nom. Diam.	Cup and Flat[3] Point Diam.			Oval Point Radius	Cone Point Angle[3] 118° ± 2° for these Lengths and Under	Cone Point Angle[3] 90° ± 2° for these Lengths and Over	Full Dog Point and Half Dog Point, [1, 2, 3] Diameter		Full Dog Point and Half Dog Point, [1, 2, 3] Length		Socket Width[4] Across Flats	
	Mean	Max.	Min.				Max.	Min.	Full	Half	Max.	Min.
#4	.053	0.057	0.049	5/64	1/8	3/16	0.070	0.065	0.050	0.025	0.0510	.050
#5	1/16	0.067	0.057	3/32	1/8	3/16	0.083	0.078	0.060	0.030	0.0635	1/16
#6	.069	0.074	0.064	7/64	1/8	3/16	0.092	0.087	0.070	0.035	0.0635	1/16
#8	5/64	0.087	0.076	1/8	3/16	1/4	0.109	0.103	0.080	0.040	0.0791	5/64
#10	3/32	0.102	0.088	9/64	3/16	1/4	0.127	0.120	0.090	0.045	0.0947	3/32
1/4	1/8	0.132	0.118	3/16	1/4	5/16	5/32	0.149	1/8	1/16	0.1270	1/8
5/16	11/64	0.172	0.156	15/64	5/16	3/8	13/64	0.195	5/32	5/64	0.1582	5/32
3/8	13/64	0.212	0.194	9/32	3/8	7/16	1/4	0.241	3/16	3/32	0.1895	3/16
7/16	15/64	0.252	0.232	21/64	7/16	1/2	19/64	0.287	7/32	7/64	0.2207	7/32
1/2	9/32	0.291	0.270	3/8	1/2	9/16	11/32	0.334	1/4	1/8	0.2520	1/4
5/8	23/64	0.371	0.347	15/32	5/8	3/4	15/32	0.456	5/16	5/32	0.3155	5/16
3/4	7/16	0.450	0.425	9/16	3/4	7/8	9/16	0.549	3/8	3/16	0.3780	3/8
7/8	33/64	0.530	0.502	21/32	7/8	1	21/32	0.642	7/16	7/32	0.5030	1/2
1	19/32	0.609	0.579	3/4	1	1 1/8	3/4	0.734	1/2	1/4	0.5655	9/16

All dimensions in inches. See Page 30 for Formulas.

[1] Where usable length of thread is less than nominal diameter, half dog point shall be used.

[2] Allowable eccentricity of dog point axis with respect to axis of screw shall not exceed 3 per cent of nominal diameter of screw with a minimum of 0.005 in.

[3] CHAMFERS AND POINT ANGLES. W = 45° + 5°, — 0°; X = 118° ± 5°; Y = (see Table 1); Z = 35° + 5°, — 0°.

[4] SOCKET DEPTH (T). The depth of the socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension.

5 SOCKET END CHAMFER (V). Socket end of screw shall be flat and chamfered. The flat shall be normal to the axis of the screw and the chamfer (V) shall be at an angle of 35° + 5°, — 0° with the surface of the flat. The chamfer shall extend to the bottom of the thread and the edge between flat and chamfer shall be slightly rounded.

6 LENGTH (L). The length of the screw shall be measured overall on a line parallel to the axis. The difference between consecutive lengths shall be as follows:

(a) for screw lengths 1/4 to 5/8 in., difference = 1/16 in.
(b) for screw lengths 5/8 to 1 in., difference = 1/8 in.
(c) for screw lengths 1 to 4 in., difference = 1/4 in.
(d) for screw lengths 4 to 6 in., difference = 1/2 in.

7 LENGTH TOLERANCE. Allowable tolerance on length (L) shall be 3 per cent on lengths 2 in. and under with a minimum of 0.020 in., one-half to be applied plus and one-half minus; on lengths over 2 in. to 6 in. plus or minus 1/32 in.; on lengths over 6 in. plus or minus 1/16 in.

8 SCREW THREADS shall conform to the American Standard for Screw Threads. (B1.1 — 1935).

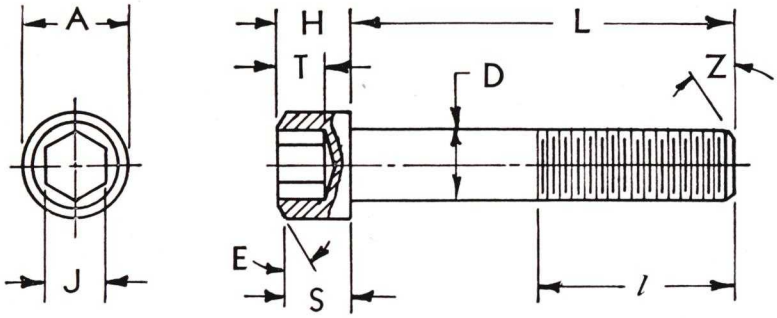


TABLE 2 DIMENSIONS OF SOCKET HEAD CAP SCREWS

D			A		H		S			J	
Body Diameter[1]			Head Diameter[2]		Head Height[3]		Head Side-Height[3]			Socket Width[4] Across Flats	
Nominal	Max.	Min.	Max.	Min.	Max.	Min.	Nominal	Max.	Min.	Max.	Min.
#4	0.1120	0.1096	0.174	0.171	0.112	0.109	0.1026	0.1043	0.1009	0.0791	5/64
#5	0.1250	0.1226	0.196	0.193	0.125	0.122	0.1146	0.1163	0.1129	0.0947	3/32
#6	0.1380	0.1353	0.217	0.214	0.138	0.134	0.1265	0.1284	0.1246	0.0947	3/32
#8	0.1640	0.1613	0.265	0.260	0.164	0.160	0.1503	0.1522	0.1484	0.1270	1/8
#10	0.1900	0.1867	5/16	0.306	0.190	0.185	0.1741	0.1765	0.1717	0.1582	5/32
1/4	0.2500	0.2464	3/8	0.367	1/4	0.244	0.2291	0.2317	0.2265	0.1895	3/16
5/16	0.3125	0.3084	7/16	0.429	5/16	0.306	0.2864	0.2894	0.2834	0.2207	7/32
3/8	0.3750	0.3705	9/16	0.553	3/8	0.368	0.3437	0.3469	0.3405	0.3155	5/16
7/16	0.4375	0.4326	5/8	0.615	7/16	0.430	0.4010	0.4046	0.3974	0.3155	5/16
1/2	0.5000	0.4948	3/4	0.739	1/2	0.492	0.4583	0.4620	0.4546	0.3780	3/8
5/8	0.6250	0.6191	7/8	0.863	5/8	0.616	0.5729	0.5771	0.5687	0.5030	1/2
3/4	0.7500	0.7436	1	0.987	3/4	0.741	0.6875	0.6920	0.6830	0.5655	9/16
7/8	0.8750	0.8680	1 1/8	1.111	7/8	0.865	0.8020	0.8069	0.7971	0.5655	9/16
1	1.0000	0.9924	1 5/16	1.297	1	0.989	0.9166	0.9220	0.9112	0.6290	5/8

All dimensions in inches. See Page 30 for Formulas.

[1] BODY DIAMETER (D) refers to the unthreaded portion and is the nominal diameter of the screw. Thread shall conform to American Standard Screw Threads.

[2] The concentricity of head, body and thread shall be such as to permit acceptance when checked with a compound go gage which will gage the maximum diameters of these three parts simultaneously. This gage shall have the head and body diameters at their maximum values (see Columns D and A, Table 2) but expressed to four decimal places and the pitch diameter at the maximum value allowed for Class 3, NC and Class 3, NF American Standard Screw Threads. (B1.1).

[3] HEAD CHAMFER (E). The head shall be flat and chamfered. The flat shall be normal to the axis of the screw and the chamfer (E) shall be at an angle of 30° ± 2° with the surface of the flat. The edge between flat and chamfer shall be slightly rounded.

[4] SOCKET DEPTH (T). The depth of socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension.

5 LENGTH UNDER HEAD (L). The length of the screw shall be measured, on a line parallel to the axis, from the plane of the bearing surface under the head to the plane of the flat of the point. The difference between consecutive lengths shall be as follows:

(a) for screw lengths 1/4 to 1 in., difference = 1/8 in.
(b) for screw lengths 1 to 4 in., difference = 1/4 in.
(c) for screw lengths 4 to 6 in., difference = 1/2 in.

6 LENGTH TOLERANCE. The allowable tolerance on the length (L) under the head on lengths 2 inches and under shall be 3 per cent of the nominal length with a minimum of 0.030, two-thirds to be applied plus and one-third minus. On lengths over 2 in. to 6 in. plus or minus 1/32 in. and on lengths over 6 in. plus or minus 1/16 in.

7 THREAD LENGTH (*l*). The length of the screw thread is measured from the extreme point to the last usable thread and shall be as follows:

for National Coarse { $l = 2D + 1/2$ in. (where this length of thread would be greater than half the screw length); $l = 1/2 L$ (where the length of thread would be greater than $2D + 1/2$ in.) }

for National Fine { $l = 1\frac{1}{2}D + 1/2$ in. (where this length of thread would be greater than three-eighths the screw length); $l = 3/8 L$ (where this length of thread would be greater than $1\frac{1}{2}D + 1/2$ in.) }

Screws too short to allow application of these formulas shall be threaded as close to the head as practicable.

8 SCREW POINT CHAMFER (Z). The point shall be flat and chamfered. The flat shall be normal to the axis of the screw and the chamfer (Z) shall be at an angle of 35° + 5°, — 0° with the plane of the flat. The chamfer shall extend to the bottom of the thread and edge between flat and chamfer shall be slightly rounded.

AMERICAN NATIONAL COARSE (N. C.) SERIES

TABLE 3

Body Length	Tolerance on Body Length		NUMBER AND DIAMETER OF SCREWS													
	+	—	No. 4	No. 5	No. 6	No. 8	No. 10	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
1/4	1/64	1/64														
3/8	1/64	1/64														
1/2	1/64	1/64							Lengths above heavy line threaded as close to head as practicable							
5/8	1/64	1/64														
3/4	1/64	1/64	23/32													
7/8	1/64	1/64	23/32	3/4	25/32	13/16										
1	1/64	1/64	23/32	3/4	25/32	13/16	7/8									
1 1/4	1/32	1/64	23/32	3/4	25/32	13/16	7/8	1	1 1/8							
1 1/2	1/32	1/64	3/4	3/4	25/32	13/16	7/8	1	1 1/8	1 1/4	1 3/8					
1 3/4	1/32	1/64	7/8	7/8	7/8	7/8	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2				
2	1/32	1/64	1	1	1	1	1	1	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4			
2 1/4	1/32	1/32				1 1/8	1 1/8	1 1/8	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4	2		
2 1/2	1/32	1/32				1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 3/8	1 1/2	1 3/4	2	2 1/4	
2 3/4	1/32	1/32				1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 1/2	1 3/4	2	2 1/4	2 1/2
3	1/32	1/32				1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 3/4	2	2 1/4	2 1/2
3 1/4	1/32	1/32						1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	1 3/4	2	2 1/4	2 1/2
3 1/2	1/32	1/32						1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	2	2 1/4	2 1/2
3 3/4	1/32	1/32						1 7/8	1 7/8	1 7/8	1 7/8	1 7/8	1 7/8	2	2 1/4	2 1/2
4	1/32	1/32						2	2	2	2	2	2	2	2 1/4	2 1/2
4 1/4	1/32	1/32								2 1/8	2 1/8	2 1/8	2 1/8	2 1/8	2 1/4	2 1/2
4 1/2	1/32	1/32								2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/2
4 3/4	1/32	1/32								2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 3/8	2 1/2
5	1/32	1/32								2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
5 1/4	1/32	1/32										2 5/8	2 5/8	2 5/8	2 5/8	2 5/8
5 1/2	1/32	1/32										2 3/4	2 3/4	2 3/4	2 3/4	2 3/4
5 3/4	1/32	1/32										2 7/8	2 7/8	2 7/8	2 7/8	2 7/8
6	1/32	1/32										3	3	3	3	3

FORMULA FOR DETERMINING THREAD LENGTHS

THREAD LENGTH (l). The length of the screw thread is measured from the extreme point of the last usable thread and shall be as follows:

For National Coarse $\begin{cases} l = 2D + \frac{1}{2}$ in. (where this length of thread would be greater than half the screw length); $\\ l = \frac{1}{2}L$ (where this length of thread would be greater than $2D + \frac{1}{2}$ in.). $\end{cases}$

Screws too short to allow application of these formulas shall be threaded as close to the head as practicable.

AMERICAN NATIONAL FINE (N. F.) SERIES

TABLE 4

Body Length	Tolerance on Body Length		NUMBER AND DIAMETER OF SCREWS													
	+	—	No. 4	No. 5	No. 6	No. 8	No. 10	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
1/4	1/64	1/64														
3/8	1/64	1/64														
1/2	1/64	1/64							Lengths above heavy line threaded as close to head as practicable							
5/8	1/64	1/64														
3/4	1/64	1/64	21/32	11/16	23/32											
7/8	1/64	1/64	21/32	11/16	23/32	3/4	25/32									
1	1/64	1/64	21/32	11/16	23/32	3/4	25/32	7/8								
1 1/4	1/32	1/64	21/32	11/16	23/32	3/4	25/32	7/8	1	1 1/16	1 3/16					
1 1/2	1/32	1/64	21/32	11/16	23/32	3/4	25/32	7/8	1	1 1/16	1 3/16	1 1/4	1 7/16			
1 3/4	1/32	1/64	21/32	11/16	23/32	3/4	25/32	7/8	1	1 1/16	1 3/16	1 1/4	1 7/16	1 5/8		
2	1/32	1/64	3/4	3/4	3/4	3/4	25/32	7/8	1	1 1/16	1 3/16	1 1/4	1 7/16	1 5/8	1 13/16	
2 1/4	1/32	1/32				7/8	7/8	7/8	1	1 1/16	1 3/16	1 1/4	1 7/16	1 5/8	1 13/16	2
2 1/2	1/32	1/32				15/16	15/16	15/16	1	1 1/16	1 3/16	1 1/4	1 7/16	1 5/8	1 13/16	2
2 3/4	1/32	1/32				1 1/32	1 1/32	1 1/32	1 1/16	1 1/16	1 3/16	1 1/4	1 7/16	1 5/8	1 13/16	2
3	1/32	1/32				1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 3/16	1 1/4	1 7/16	1 5/8	1 13/16	2
3 1/4	1/32	1/32						1 7/32	1 7/32	1 7/32	1 1/4	1 1/4	1 7/16	1 5/8	1 13/16	2
3 1/2	1/32	1/32						1 5/16	1 5/16	1 5/16	1 5/16	1 5/16	1 7/16	1 5/8	1 13/16	2
3 3/4	1/32	1/32						1 13/32	1 13/32	1 13/32	1 13/32	1 13/32	1 7/16	1 5/8	1 13/16	2
4	1/32	1/32						1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 5/8	1 13/16	2
4 1/4	1/32	1/32								1 19/32	1 19/32	1 19/32	1 19/32	1 5/8	1 13/16	2
4 1/2	1/32	1/32								1 11/16	1 11/16	1 11/16	1 11/16	1 11/16	1 13/16	2
4 3/4	1/32	1/32								1 25/32	1 25/32	1 25/32	1 25/32	1 25/32	1 13/16	2
5	1/32	1/32								1 7/8	1 7/8	1 7/8	1 7/8	1 7/8	1 7/8	2
5 1/4	1/32	1/32										1 31/32	1 31/32	1 31/32	1 31/32	2
5 1/2	1/32	1/32										2 1/16	2 1/16	2 1/16	2 1/16	2 1/16
5 3/4	1/32	1/32										2 5/32	2 5/32	2 5/32	2 5/32	2 5/32
6	1/32	1/32										2 1/4	2 1/4	2 1/4	2 1/4	2 1/4

FORMULA FOR DETERMINING THREAD LENGTHS

THREAD LENGTH (*l*). The length of the screw thread is measured from the extreme point of the last usable thread and shall be as follows:

For National Fine { **$l = 1\frac{1}{2}D + \frac{1}{2}$ in. (where this length of thread would be greater than three-eighths the screw length);**
$l = \frac{3}{8}L$ (where this length of thread would be greater than $1\frac{1}{2}D + \frac{1}{2}$ in.).

Screws too short to allow application of these formulas shall be threaded as close to the head as practicable.

DIMENSIONS — FLAT HEAD CAP SCREWS

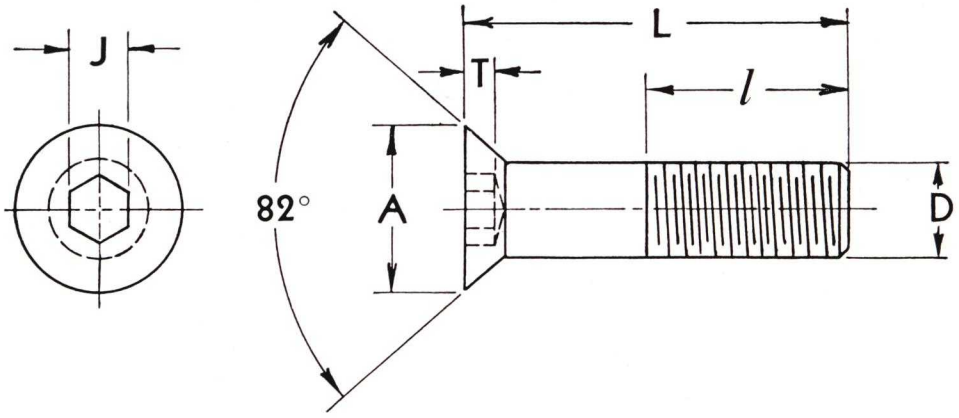


TABLE 5 DIMENSIONS OF FLAT HEAD CAP SCREWS

D			A		J	
Body Diameter			Head Diameter		Socket Width Across Flats	
Nominal	Max.	Min.	Max.	Min.	Max.	Min.
#4	.1120	.1096	.223	.213	.0635	1/16
#6	.1380	.1353	.270	.260	.0791	5/64
#8	.1640	.1613	.317	.307	.0947	3/32
#10	.1900	.1867	.375	.360	.1270	1/8
1/4	.2500	.2464	.500	.485	.1582	5/32
5/16	.3125	.3084	.625	.610	.1895	3/16
3/8	.3750	.3705	.750	.735	.2207	7/32
7/16	.4375	.4326	.812	.797	.2520	1/4
1/2	.5000	.4948	.875	.860	.3155	5/16
5/8	.6250	.6191	1.125	1.110	.3780	3/8
3/4	.7500	.7436	1.375	1.360	.3780	3/8

All dimensions in inches.

SOCKET DEPTH (T). The depth of socket shall be as great as practicable but varying conditions render it inadvisable to specify definite values for this dimension.

THREAD LENGTH (l). The length of the screw thread is measured from the extreme point to the last usable thread and shall be as follows:

for National Coarse { $l = 2D + \frac{1}{2}$ in. (where this length of thread would be greater than half the screw length); $l = \frac{1}{2}L$ (where this length of thread would be greater than $2D + \frac{1}{2}$ in.).

for National Fine { $l = 1\frac{1}{2}D + \frac{1}{2}$ in. (where this length of thread would be greater than three-eighths the screw length); $l = \frac{3}{8}L$ (where this length of thread would be greater than $1\frac{1}{2}D + \frac{1}{2}$ in.).

Screws too short to allow application of these formulas shall be threaded as close to head as practicable.

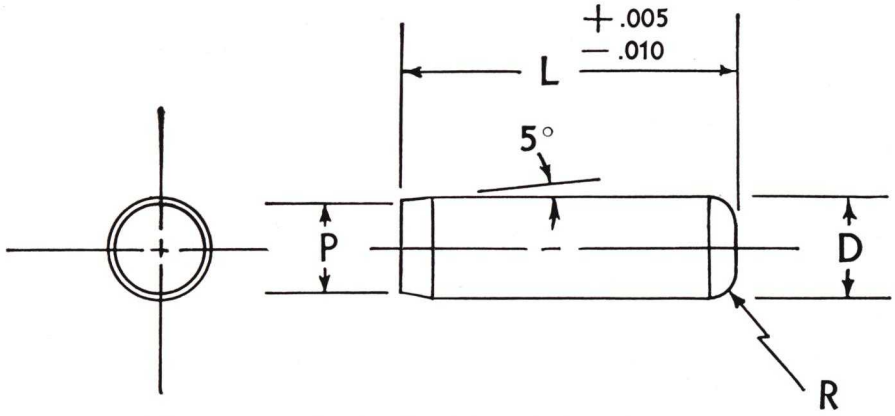


TABLE 6 DIMENSIONS OF DOWEL PINS

Nom. Diam.	Diameter — D: Standard Pin (.0002 over basic size) Max.	Standard Pin Min.	Oversize Pin (.001 over basic size) Max.	Oversize Pin Min.	P Point Diam.	R Top Radius
1/8	.1253	.1251	.1261	.1259	.119	3/64
3/16	.1878	.1876	.1886	.1884	.176	3/64
1/4	.2503	.2501	.2511	.2509	.239	1/16
5/16	.3128	.3126	.3136	.3134	.301	1/16
3/8	.3753	.3751	.3761	.3759	.364	5/64
7/16	.4378	.4376	.4386	.4384	.4205	3/32
1/2	.5003	.5001	.5011	.5009	.483	7/64
5/8	.6253	.6251	.6261	.6259	.608	1/8
3/4	.7503	.7501	.7511	.7509	.728	1/8
7/8	.8753	.8751	.8761	.8759	.853	1/8
1	1.0003	1.0001	1.0011	1.0009	.978	1/8

All dimensions in inches.

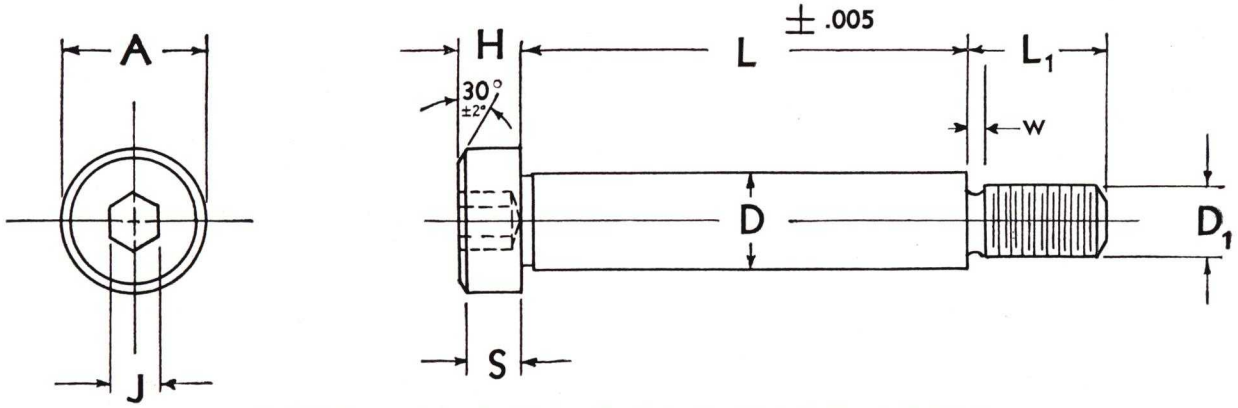


TABLE 7 DIMENSIONS OF SHOULDER SCREWS

D Shoulder Diam. Nom.	D Shoulder Diam. Max.	D Shoulder Diam. Min.	A Head Diam. Max.	A Head Diam. Min.	H Head Height Max.	H Head Height Min.	S Head Side Height Max.	S Head Side Height Min.	D_1 Thread Diam. Nom.	L_1 Thread Length Nom.	w Neck Width	J Socket Width Across Flats Max.	J Socket Width Across Flats Min.
1/4	.249	.247	3/8	.367	3/16	.182	.1641	.1589	#10-24	3/8	5/64	.127	1/8
5/16	.311	.309	7/16	.429	7/32	.213	.1899	.1839	1/4-20	7/16	5/64	.158	5/32
3/8	.374	.372	9/16	.553	1/4	.244	.2155	.2091	5/16-18	1/2	5/64	.189	3/16
1/2	.499	.497	3/4	.739	5/16	.306	.2668	.2594	3/8-16	5/8	3/32	.252	1/4
5/8	.624	.622	7/8	.863	3/8	.368	.3181	.3097	1/2-13	3/4	1/8	.315	5/16
3/4	.749	.747	1	.987	1/2	.492	.4341	.4251	5/8-11	7/8	5/32	.378	3/8
1	.999	.997	1 5/16	1.297	5/8	.616	.5366	.5258	3/4-10	1	5/32	.503	1/2

All dimensions in inches.
Shoulder length (L) from 3/4 in. to 5 in. inclusive in increments of 1/4 in.; above 5 in., in increments of 1/2 in.

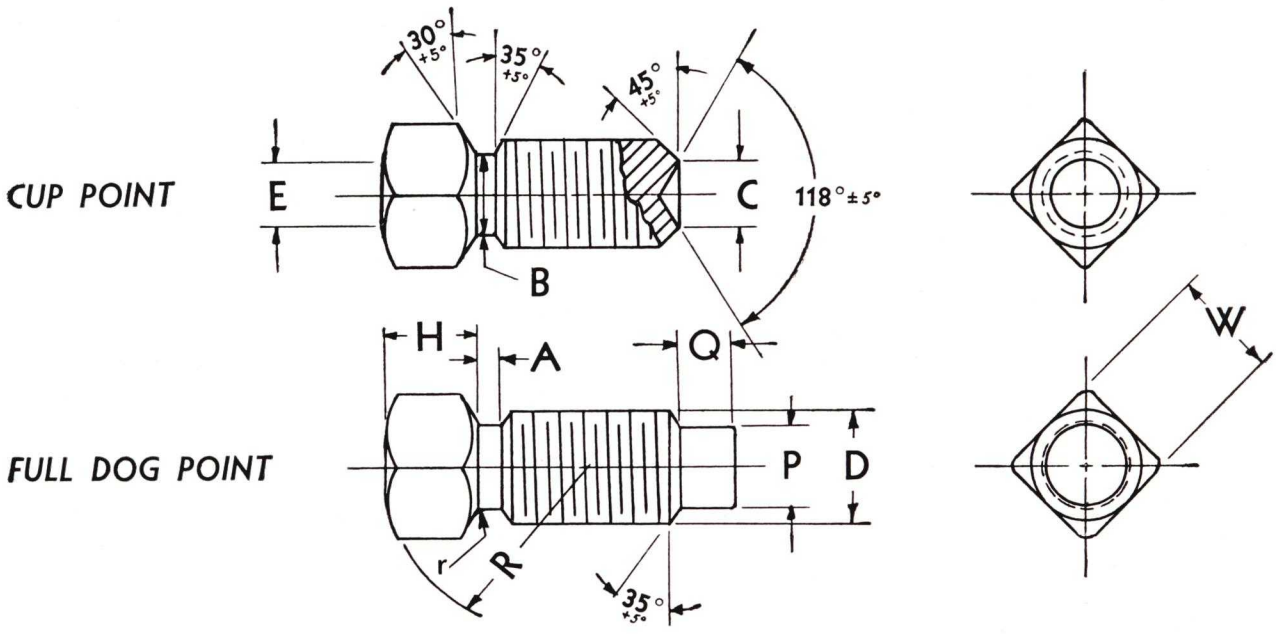
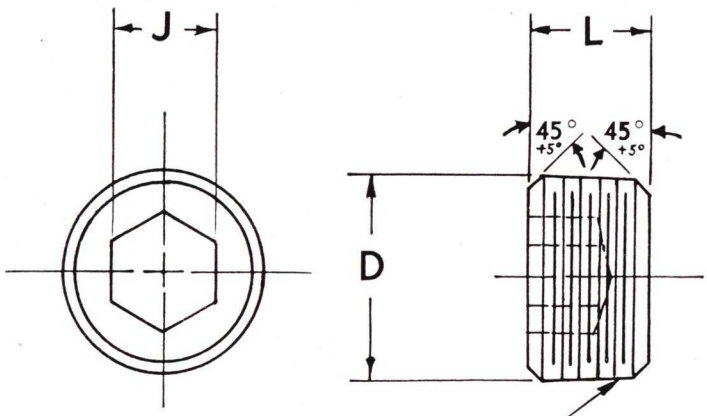


TABLE 8 DIMENSIONS OF SQUARE HEAD SET SCREWS

D	W	H		A	r	R	E	B		C		P		Q
Nom. Dia.	Width Across Flats	Head Hgt. Max.	Head Hgt. Min.	Neck Width	Neck Radius	Head Rad.	Dia. of Flat	Neck Dia. Max.	Neck Dia. Min.	Cup Dia. Max.	Cup Dia. Min.	Point Dia. Max.	Point Dia. Min.	Point Length
1/4	1/4	.197	.178	5/64	1/32	5/8	5/32	.196	.191	.132	.118	5/32	.149	1/8
5/16	5/16	.245	.224	3/32	1/32	25/32	7/32	.252	.247	.172	.156	13/64	.195	5/32
3/8	3/8	.293	.270	7/64	1/32	15/16	1/4	.307	.302	.212	.194	1/4	.241	3/16
7/16	7/16	.341	.315	1/8	3/64	1 3/32	9/32	.360	.355	.252	.232	19/64	.287	7/32
1/2	1/2	.389	.361	1/8	3/64	1 1/4	5/16	.417	.412	.291	.270	11/32	.334	1/4
9/16	9/16	.437	.407	9/64	3/64	1 13/32	3/8	.472	.467	.332	.309	25/64	.379	9/32
5/8	5/8	.485	.452	5/32	1/16	1 9/16	7/16	.527	.522	.371	.347	15/32	.456	5/16
3/4	3/4	.582	.544	3/16	1/16	1 7/8	1/2	.642	.637	.450	.425	9/16	.549	3/8
7/8	7/8	.678	.635	7/32	1/16	2 3/16	19/32	.755	.750	.530	.502	21/32	.642	7/16
1	1	.774	.726	7/32	5/64	2 1/2	21/32	.865	.860	.609	.579	3/4	.734	1/2
1 1/8	1 1/8	.870	.817	7/32	5/64	2 1/2	3/4	.965	.960	.689	.655	27/32	.826	9/16
1 1/4	1 1/4	.966	.908	1/4	5/64	2 1/2	27/32	1.095	1.090	.767	.733	15/16	.920	5/8
1 1/2	1 1/2	1.159	1.091	1/4	3/32	2 1/2	1	1.315	1.310	.926	.886	1 1/8	1.105	3/4

All dimensions in inches.



BRIGGS STD. PIPE THRD.
TAPER ¾" PER FOOT

Table 9 DIMENSIONS OF PIPE PLUGS

Size	Thr'ds per Inch	D	L	J	
		Nominal Diameter Large End	Length of Plug	Socket Width Across Flats	
				Max.	Min.
1/8	27	.405	3/8	.1895	3/16
1/4	18	.540	7/16	.2520	1/4
3/8	18	.675	1/2	.3155	5/16
1/2	14	.840	9/16	.3780	3/8
3/4	14	1.050	5/8	.5655	9/16
1	11 1/2	1.315	3/4	.6290	5/8

All dimensions in inches.

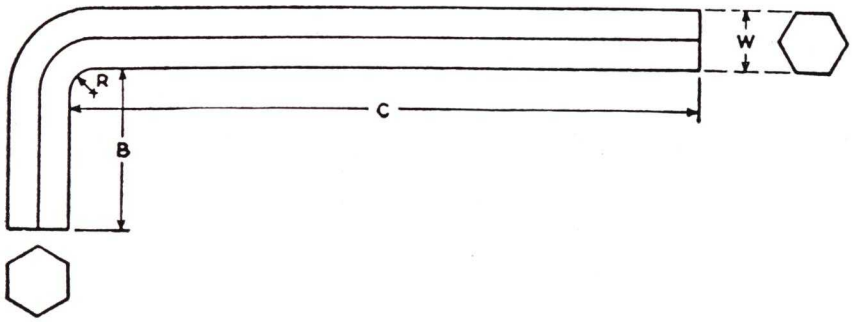


TABLE 10 DIMENSIONS OF HEXAGONAL KEYS

D		W		B		C				R
Screw Size		Hexagon Width Across Flats		Length Short Arm		Length Long Arm				Radius of Bend
						Short Series		Long Series		
Set	Cap	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
#4		.050	0.0490	21/32	15/32	1 27/32	1 21/32			1/16
#5		1/16	0.0615	21/32	15/32	1 27/32	1 21/32			1/16
#6		1/16	0.0615	21/32	15/32	1 27/32	1 21/32			1/16
#8	#4	5/64	0.0771	45/64	33/64	1 31/32	1 25/32			5/64
#10	#5, #6	3/32	0.0927	3/4	9/16	2 3/32	1 29/32			3/32
1/4	#8	1/8	0.1235	27/32	21/32	2 11/32	2 5/32	3 27/32	3 21/32	1/8
5/16	#10	5/32	0.1547	15/16	3/4	2 19/32	2 13/32	4 7/32	4 1/32	5/32
3/8	1/4	3/16	0.1860	1 1/32	27/32	2 27/32	2 21/32	4 19/32	4 13/32	3/16
7/16	5/16	7/32	0.2172	1 1/8	15/16	3 3/32	2 29/32	4 31/32	4 25/32	7/32
1/2		1/4	0.2485	1 7/32	1 1/32	3 11/32	3 5/32	5 11/32	5 5/32	1/4
5/8	3/8, 7/16	5/16	0.3110	1 11/32	1 5/32	3 27/32	3 21/32	6 3/32	5 29/32	5/16
3/4	1/2	3/8	0.3735	1 15/32	1 9/32	4 11/32	4 5/32	6 27/32	6 21/32	3/8
7/8	5/8	1/2	0.4985	1 23/32	1 17/32	5 11/32	5 5/32	8 11/32	8 5/32	1/2
1		9/16	0.5600	1 27/32	1 21/32	5 27/32	5 21/32	9 3/32	8 29/32	9/16
	3/4, 7/8	9/16	0.5600	1 27/32	1 21/32	5 27/32	5 21/32	9 3/32	8 29/32	9/16
	1	5/8	0.6225	1 31/32	1 25/32	6 11/32	6 5/32	9 27/32	9 21/32	5/8

All dimensions in inches. **See Page 30 for Formulas.**

DIMENSIONS FOR HEXAGONAL KEYS

HEXAGON WIDTH ACROSS FLATS (W) — Table 10, Page 29
W(max.) — no formula — see table for values
W(min.) = W(max.) — 0.0010 (where W(max.) = 0 to 3/32, incl.)
W(min.) = W(max.) — 0.0015 (where W(max.) = 1/8 to 1/2, incl.)
W(min.) = W(max.) — 0.0025 (where W(max.) = 9/16 to 1, incl.)

SHORT ARM LENGTH (B) FOR BOTH LONG AND SHORT SERIES — Table 10
B(max.) = 3W(max.) + 15/32 (where W(max.) = 1/16 to 7/32, incl.)
B(min.) = 3W(max.) + 9/32 (where W(max.) = 1/16 to 7/32, incl.)
B(max.) = 2W(max.) + 23/32 (where W(max.) = 1/4 to 1, incl.)
B(min.) = 2W(max.) + 17/32 (where W(max.) = 1/4 to 1, incl.)

LONG ARM LENGTH (C) FOR SHORT SERIES — Table 10
C(max.) = 8W(max.) + 1 11/32
C(min.) = 8W(max.) + 1 5/32

LONG ARM LENGTH (C) FOR LONG SERIES — Table 10
C(max.) = 12W(max.) + 2 11/32
C(min.) = 12W(max.) + 2 5/32

RADIUS OF BEND (R) — Table 10
R = W(max.)

HEAD DIMENSIONS FOR SOCKET HEAD CAP SCREWS

BODY DIAMETER (D) — Table 2, Page 23
D(max.) = Basic or nominal size — see tables for values
D(min.) = D(max.) — PD tolerance, Class 2, NC

HEAD DIAMETER (A) — Table 2
A(max.) — no formula — see tables for values
A(min.) = A(max.) — 2 PD tolerance, Class 2, NC

HEAD HEIGHT (H) — Table 2
H(max.) = D(max.)
H(min.) = H(max). — 2 PD tolerance, Class 3, NC

HEAD SIDE-HEIGHT (S) — Table 2
S(nom.) = 11/12D
S(max.) = S(nom.) + PD tolerance, Class 3, NC
S(min.) = S(nom.) — PD tolerance, Class 3, NC

POINT DIMENSIONS FOR SOCKET SET SCREWS

CUP AND FLAT DIAMETER (C) — Table 1, Page 22
C(max.) = 1/2D + 2 PD tolerance, Class 2, NC (where D = No. 5 to No. 12, incl.)
C(min.) = 1/2D — 2 PD tolerance, Class 2, NC (where D = No. 5 to No. 12, incl.)
C(max.) = 5/8D — 1/32 + 2 PD tolerance, Class 2, NC (where D = 1/4 to 2 incl.)
C(min.) = 5/8D — 1/32 — 2 PD tolerance, Class 2, NC (where D = 1/4 to 2 incl.)

OVAL RADIUS (R) — Table 1
R = 3/4D

CONE ANGLE (Y) — Table 1
Y = 118° ± 2° (where thread length is equal to or less than 3/4D)
Y = 90° ± 2° (where thread length is greater than 3/4D)

FULL DOG LENGTH (Q) — Table 1
Q = 1/2D

HALF DOG LENGTH (q) — Table 1
q = 1/4D

DOG DIAMETER (P) — Table 1
P(max.) = 2/3D (where D = No. 5 to No. 12, incl.)
P(max.) = 3/4D — 1/32 (where D = 1/4 to 9/16, incl.)
P(max.) = 3/4D (where D = 5/8 to 2, incl.)
P(min.) = P(max.) — 2 PD tolerance, Class 2, NC (for all values of D)

SOCKET DIMENSIONS FOR HOLLOW SET, CAP AND SHOULDER SCREWS; PIPE PLUGS

SOCKET WIDTH ACROSS FLATS (J) FOR HEXAGONAL SOCKETS — Tables 1, 2, 5, 7 and 9
J(min.) — no formula — see table for values
J(max.) = J(min.) + 0.001 (where J(min.) = 1/16 to 3/32, incl.)
J(max.) = J(min.) + 0.002 (where J(min.) = 1/8 to 1/4, incl.)
J(max.) = J(min.) + 0.003 (where J(min.) = 5/16 to 9/16, incl.)
J(max.) = J(min.) + 0.004 (where J(min.) = 5/8 to 1, incl.)

ALLEN SOCKET HEAD CAP SCREWS

Length Under Head	DIAMETER OF CAP SCREWS																			
	No. 10		1/4		5/16		3/8		7/16		1/2		5/8		3/4		7/8		1	
	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.
3/8	100	–10	100	1	100	1–12														
1/2	100	–11	100	1– 3	100	2	100	3– 7	100	4–14	50	3–11								
5/8	100	–12	100	1– 6	100	2– 4	100	3–12	100	5– 3	50	4								
3/4	100	–14	100	1– 8	100	2– 8	100	4	100	5– 9	50	4– 3								
7/8	100	–15	100	1–10	100	2–11	100	4– 5	100	6	50	4– 8								
1	100	1	100	1–12	100	2–14	100	4–10	100	6– 6	50	4–12	25	3–14						
1 1/4	100	1– 4	100	2– 2	100	3– 6	100	5– 3	50	3–12	50	5– 5	25	4– 5	25	6– 9				
1 1/2	100	1– 7	100	2– 8	100	3–14	100	6	50	4– 3	50	5–14	25	4–12	25	7– 5				
1 3/4	100	1–10	100	2–12	100	4– 6	50	3– 5	50	4–10	50	6– 9	25	5– 3	25	7–13	25	11– 6		
2	100	1–14	100	3	100	4–14	50	3–14	50	5	50	7– 6	25	5–12	25	8– 8	25	12– 2	25	16–11
2 1/4			100	3– 6	100	5– 6	50	4– 4	50	5– 8	25	4	25	6– 4	25	9– 2	25	13– 4	25	17–12
2 1/2			100	3–12	100	5–14	50	4– 8	50	6	25	4– 6	25	6–12	25	9–14	25	14– 3	25	19– 4
2 3/4			100	3–15	100	6– 6	50	4–14	25	3– 4	25	4–10	25	7– 4	25	10–10	25	15– 5	25	20– 7
3			100	4– 4	100	6–14	50	5– 2	25	3– 8	25	4–14	25	7–14	25	11– 7	25	16– 3	25	21– 9
3 1/4					50	3–11	50	5– 6	25	3–12	25	5– 2	25	8– 5	25	12– 2	25	17– 1	25	23– 1
3 1/2					50	3–14	50	5–12	25	4	25	5–10	25	8–15	25	13	25	18– 4	25	24–11
3 3/4							50	6– 3	25	4– 4	25	5–15	25	9– 7	25	13–13	25	19– 3	25	26
4							50	6–10	25	4– 8	25	6– 5	25	9–15	25	14– 9	25	19–15	25	27– 8
4 1/4							50	6–14			25	6–10	25	10– 7	25	15– 6	25	21– 3	25	28–12
4 1/2							50	7– 7			25	7	25	10–14	25	16– 3	25	22– 4	25	30
4 3/4							50	8– 2			25	7– 6	25	11– 5	25	17	25	23– 8	25	31– 4
5							50	8–12			25	7– 9	25	11–13	25	17–10	25	24– 8	25	32– 8
5 1/4											25	7–13	25	12– 8	25	18– 2	25	25– 8	25	33–12
5 1/2											25	8– 4	25	13– 2	25	19	25	26– 8	25	35
5 3/4											25	8– 8	25	13– 8	25	19–10	25	27– 6	25	36– 4
6											25	8–12	25	13–14	25	20– 4	25	28– 4	25	37– 8

ALLEN "TRU-GROUND" DOWEL PINS

Length Overall	DIAMETER OF DOWEL PINS																			
	1/8		3/16		1/4		5/16		3/8		7/16		1/2		5/8		3/4		7/8	
	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.
3/8	100	– 2½																		
1/2	100	– 3	100	– 5	100	–14	100	1– 5	100	1–14	100	2– 4	100	2–13						
5/8	100	– 3½	100	– 7	100	1	100	1– 9	100	2– 1	100	2–12	100	3– 8						
3/4	100	– 4	100	– 9	100	1– 2	100	1–13	100	2– 4	100	3– 4	100	4– 4						
7/8	100	– 5	100	–11	100	1– 4	100	2	100	2–11	100	3–12	100	4–13						
1	100	– 6	100	–12	100	1– 6	100	2– 3	100	3– 2	100	4– 5	100	6	25	2– 4				
1 1/4	100	– 7	100	1	100	1–12	100	2–13	100	3–14	100	5– 6	50	3– 7	25	2–12				
1 1/2	100	– 8½	100	1– 4	100	2– 2	100	3– 4	100	4–13	100	6– 7	50	4– 4	25	3– 4				
1 3/4	100	–10	100	1– 6	100	2– 8	100	3–11	100	5– 8	50	3–12	50	4–15	25	3–14				
2	100	–12	100	1– 9	100	2–14	100	4– 7	100	6– 6	50	4– 4	50	5–10	25	4– 6	25	6– 5	25	8–12
2 1/4						3– 4	100	4–14	50	3– 8	50	4–14	50	6– 5	25	5	25	7 –3	25	9–12
2 1/2						3–10	100	5– 8	50	4	50	5– 6	25	3– 8	25	5– 8	25	8	25	10–12
2 3/4							100	6– 1	50	4– 5	50	6	25	3–14	25	6– 2	25	8–14	25	11–12
3							100	6–10	50	4–12	50	6– 8	25	4– 3	25	6–10	25	9– 9	25	13
3 1/4							100	7– 4	50	5– 4	50	7	25	4–10	25	7– 4	25	10– 5	25	14– 8
3 1/2							100	7–12	50	5–12	50	7– 8	25	4–15	25	7–12	25	11– 1	10	6
3 3/4									50	6–4	25	4– 2	25	5– 5	25	8– 4	25	11–14	10	6– 8
4											25	4– 4	25	5–10	25	8–14	25	12–10	10	6–14
4 1/4															25	9– 6	25	13– 4	10	7 –6
4 1/2															25	9–15	25	13–14	12	8– 8
4 3/4															25	10– 8	25	14– 8	12	10
5															25	11	25	15– 8	12	10– 8
5 1/4																	25	16 –8	12	11
5 1/2																	25	17– 8	12	11– 8
5 3/4																	25	18– 8	12	12
6																	25	19– 8	12	12– 8

PACKING WEIGHTS

ALLEN HOLLOW SET SCREWS

Length Overall	DIAMETER OF SET SCREWS																			
	No. 10		1/4		5/16		3/8		7/16		1/2		5/8		3/4		7/8		1	
	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.
3/16	100	– 2	100	– 4																
1/4	100	– 2	100	– 4	100	– 6	100	–11												
5/16	100	– 3	100	– 5	100	– 8	100	–12												
3/8	100	– 4	100	– 6	100	–10	100	–15	100	1– 2	100	1– 8								
7/16	100	– 4	100	– 7	100	–11	100	1	100	1– 4	100	1–12								
1/2	100	– 5	100	– 8	100	–12	100	1– 2	100	1– 7	100	2	100	3						
5/8	100	– 5	100	–10	100	1	100	1– 5	100	1–12	100	2– 8	50	1–12	50	2–12				
3/4	100	– 7	100	–12	100	1– 3	100	1–12	100	2– 4	100	2–12	50	2– 2	50	3– 4	25	2– 2		
7/8	100	– 7	100	–14	100	1– 7	100	2	100	2–10	100	3– 8	50	2–10	50	3–12	25	2– 8		
1	100	– 8	100	1	100	1–11	100	2– 5	100	3– 2	100	4	50	3	50	4– 4	25	2–12	25	3–12
1 1/4	100	– 9	100	1– 4	100	2	100	2–14	100	4	100	4–15	50	3–14	50	5– 8	25	3– 8	25	4– 8
1 1/2			100	1– 8	100	2– 8	100	3– 8	100	4–12	100	6	50	4–12	50	6–12	25	4– 6	25	5– 8
1 3/4			100	1–12	100	2–13	100	4– 2	50	2–12	50	3– 9	50	5–12	25	4	25	5– 2	25	6– 8
2			100	2	100	3– 4	100	4–10	50	3– 5	50	4– 4	50	6– 8	25	4–10	25	6	25	7–12
2 1/2			100	2– 8	100	4	100	6	50	4– 2	50	5– 4	25	4– 4	25	6– 2	25	7–12	25	9–12
3			100	3– 2	100	5	100	7– 4	50	4–14	50	6– 4	25	5– 4	25	7– 6	25	9– 8	25	12–12

SQUARE HEAD SET SCREWS Weight Per 100 Screws

Length Under Head	DIAMETER OF SCREWS									
	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1
	Weight lbs. ozs.	Weight lbs. ozs.	Weight lbs. ozs.	Weight lbs. ozs.	Weight lbs. ozs.	Weight lbs. ozs.	Weight lbs. ozs.	Weight lbs. ozs.	Weight lbs. ozs.	Weight lbs. ozs.
1/2	– 8	1– 6	2– 4							
5/8	1	1– 8	2–10	4	4– 9					
3/4	1– 2	2	2–14	4– 6	5–14	10– 4	10–14			
7/8	1– 3	2– 2	3– 4	4–13	6– 6	11	11–13			
1	1– 5	2– 4	3– 8	5– 4	7– 2	12–12	12– 2	19– 5	29	40
1 1/4	1– 8	2– 7	4– 4	6	8–10	13– 8	14– 3	22	33	45
1 1/2	1– 9	3– 2	4–12	6–10	9–14	14	15–12	24– 8	35– 8	50
1 3/4	2– 1	3– 7	5– 6	7–10	10– 8	14– 8	17–10	27	39	54
2	2– 3	4– 2	6– 2	8–10	11–12	15	19– 8	29– 8	43	58
2 1/4	2–10	4– 6	6–14	9– 6	12–14	15– 8	21	32– 2	46– 8	62–14
2 1/2	3– 1	5	7– 8	10– 2	14– 2	16– 8	22–12	35	50	67–12
2 3/4	3– 8	5– 6	8	11– 4	15– 2	17– 8	24–12	37– 8	53– 8	72– 6
3	4	5–12	8–10	12– 3	16– 3	18– 8	26– 8	40	57	77

ALLEN SHOULDER SCREWS

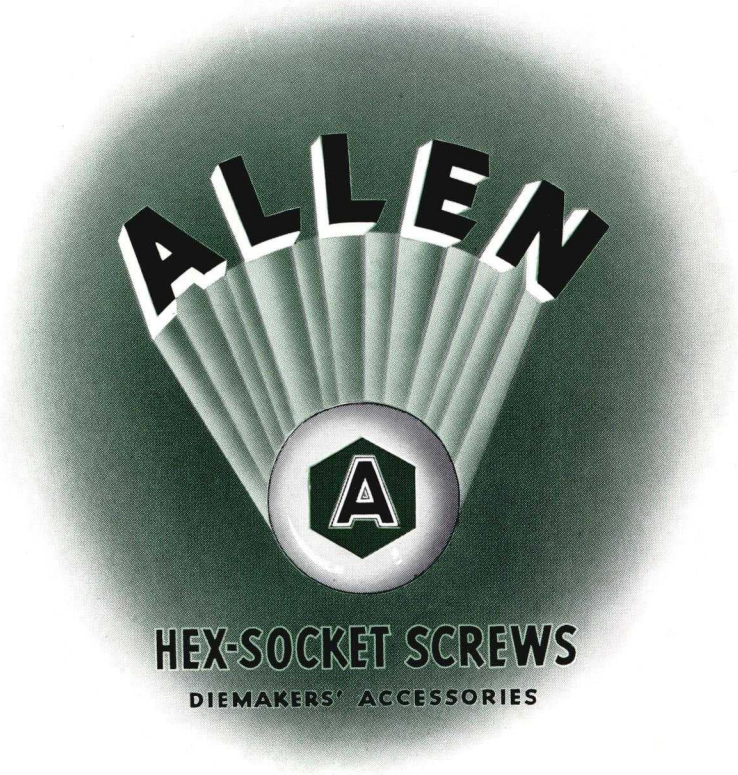
Shoulder Length	SHOULDER DIAMETER							
	3/8		1/2		5/8		3/4	
	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.	No. in Box	Weight lbs. ozs.
1	100	5– 8	50	5–10	25			
1 1/4	100	6– 4	50	6– 4	25	4–14		
1 1/2	50	3–10	50	6–14	25	5–10	25	8–12
1 3/4	50	4	50	7– 8	25	6– 3	25	9– 8
2	50	4– 6	25	4– 2	25	6–10	25	10– 5
2 1/4	50	4–12	25	4– 8	25	7– 2	25	11–14
2 1/2	50	5– 3	25	4–12	25	7–10	25	12–14
2 3/4	50	5– 8	25	5– 2	25	8– 2		
3	50	5–14	25	5– 8	25	8–14		
3 1/4	50	6– 5	25	5–14	25	9– 8		
3 1/2	50	6–12	25	6– 3	25	10		
3 3/4	50	7– 1	25	6– 8	25	10– 8		
4	50	7– 6	25	6–14	25	11		
4 1/4			25	7– 2	25	11– 9		
4 1/2			25	7– 8	25	12– 2		
4 3/4			25	8	25	12–12		
5			25	8– 8	25	13– 3		

ALLEN HEXAGONAL KEYS

Width Across Flats	For Set Screw Size	Number in Box	Weight lbs. ozs.
5/64	No. 8	100	– 8
5/32	No. 10	100	–10
1/8	1/4	100	1– 4
5/32	5/16	100	2– 2
3/16	3/8	100	3– 4
7/32	7/16	50	2– 8
1/4	1/2	50	3– 6
5/16	5/8	50	6
3/8	3/4	25	4–15
1/2	7/8	25	10–12
9/16	1	25	14–12

ALLEN PIPE PLUGS

Diameter	1/8	1/4	3/8	1/2	3/4	1
Weights Steel	lbs. ozs. 1–1	lbs. ozs. 2–8	lbs. ozs. 4–6	lbs. ozs. 6–8	ibs. ozs. 6–2	lbs. ozs. 11
In a Box	100	100	100	100	50	50



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